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for the health sciences*



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Joseph O'Dwyer, M.D. (Photo reproduced from Pediatrics 5 (1898), opposite p. 95. Courtesy of the Dittrick Museum of Medical History.)

Diphtheria: Dr. Joseph O'Dwyer and His Intubation Tubes

by Craig Gelfand

Previous to the introduction of effective antitoxins, diphtheria, commonly called croup, was a widespread disease claiming many victims, especially young children. These children were dying from the severe dyspnea, and consequent suffocation, typical of laryngeal diphtheria. In the nineteenth century, the most widespread treatment for diphtheria patients had been tracheotomy. Physicians had not found a more satisfactory method of relieving the occlusion created by a false membrane, or pseudo-membrane, which forms around the mucous membrane, especially within the larynx, during the course of the disease. When developed, this false membrane can reduce the air flow into the lungs enough to cause suffocation. The only way physicians could ensure that air would get to the lungs was to perform a tracheotomy. In most cases in which regular, unlabored breathing could be restored, the disease would run its course, and the child would recover. However, a tracheotomy would only add to the weakness and trauma of an already ill individual. Further complicating a tracheotomy was the absence of sepsis, which made tracheotomy a much greater risk. Typically, infants and children up to three or four years of age would have a one in ten chance of survival after tracheotomy. Without tracheotomy, however, a child had little or no chance to recover, as the pseudo-membrane would eventually cause suffocation. In either case, statistics were such that diphtheria was a horrifying prospect to patient, parent and physician alike.

Certainly there must be a better way to treat diphtheria. So thought Paris physician Dr. E. Bouchut. On September 14, 1855, he presented to his peers his idea on a method to avoid tracheotomy. He proposed the insertion of a hollow tube into the larynx. This tube would allow air to pass and prevent the false membrane from occluding the flow of air. A commission of Bouchut's medical peers, headed by Dr. Armand Trousseau, studied his proposal and reached this conclusion, which appeared in the *Gazette des Hopitaux*: "It [intubation] can only very rarely supplant tracheotomy, which is the principle means of opposing croup when medical measures fail."¹

The answer was not nearly as polite from the medical community in general. His peers thought the idea of inserting a tube into the larynx so ludicrous that Bouchut lost all of his credibility as a respected member of the medical community. He persevered, however, and gained a respectable practice in pediatrics which included, in 1858, three recoveries out of ten cases of diphtheria treated with his method of tubage. This method, and the potentially successful use of it, was to be rediscovered independently about twenty-five years later in the United States.

The American innovator who would eventually become one of the best known physicians of his day was Dr. Joseph O'Dwyer of New York City. He was born in Cleveland, Ohio, on October 12, 1841, but was raised and schooled in London, Ontario, Canada. In 1864 O'Dwyer was admitted to the New York College of Physicians and Surgeons, from which he graduated in 1866.

O'Dwyer had proven himself to be a pensive individual, rather than a rugged, athletic type. He had also suffered from a pulmonary hemorrhage early in life. He spent three years with a surveying team in the woods of Michigan, taking advantage of the fresh air. He counted himself "a case of consumption cured,"³ but had also gained an easily exhaustible constitution. Even so, O'Dwyer displayed a resiliency and strength uncommon to most. In 1863 and 1864 sporadic typhoid and typhus fever had grown to epidemic proportions. O'Dwyer contracted typhoid while attending to patients as part of his training at the New York College. He had known, almost to the instant, when he contracted the disease. Believing himself doomed, O'Dwyer proceeded, at will, to his own death bed. At a memorial address for Joseph O'Dwyer years later, close friend Dr. W. P. Northrup recalled:

Deliberately he finished his work, wrote out his wishes as to the disposal of his things, left letters for his friends, and went to bed. . . . Then followed days of which he could never give any account. His recovery was complete, without complications or sequelae, and without impairment of any of his powers.²

Even with his easily tired constitution, O'Dwyer was a stronger individual than others who had never had health disorders.

O'Dwyer demonstrated great promise as a physician. His first employment was as sanitary superintendent on the new staff at Charity Hospital on Blackwell's Island, recently separated from the New York City hospitals. His abilities were tested early on when a cholera outbreak at a workhouse caused some two hundred cases. O'Dwyer, as sanitary superintendent, was in charge of combatting the outbreak. He performed his duty, containing the disease with only the minimum amount of fuss.

By 1869 O'Dwyer had built a stable obstetrics practice with Dr. Warren Schoonover at Second Avenue and 56th Street. Over the years, this practice brought him the experience of some 3,000 cases. In 1872 he moved his residence to 65th Street and Lexington Avenue. As coincidence would have it, this new home was quite near the site of the new New York Foundling Asylum, which opened a year later. O'Dwyer became a member of the first staff at the newly opened facility.

The asylum was full of orphans and other children too poor to gain medical attention at the private hospitals of New York City. As was not uncommon at the time, many of these children suffered from diphtheria. From 1873 to 1880, tracheotomy was the sole method used to treat croup at the Foundling Asylum. This mode of treatment was clearly inadequate, however, since not one recovery in eight years of practice had been recorded at the New York Foundling Asylum. In 1880 O'Dwyer began thinking of ways to open a channel through the larynx without creating an open wound. He decided, apparently unaware of Bouchut's previous work, that somehow there must be a way to hold apart the swollen false and true membranes to allow air to pass, preventing suffocation until the disease had run its course.

In 1882 O'Dwyer began his research, aided by Dr. W. P. Northrup, a recent medical graduate. Northrup was to work in the autopsy room. That research was ever begun was a consequence of O'Dwyer's persistence and determination. The sisters at the hospital knew that croup meant almost certain death. They believed that even if research led to some kind of temporary relief, it would only extend the period of misery a helpless child would have to endure before it could finally rest in the next world. O'Dwyer nevertheless gained permission from Sister Superior Irene to quietly conduct research in the autopsy room of the hospital. Sister Superior Irene later told Dr. Northrup of her concerns that she had erred in allowing the research: "She often told me if she knew what a terrible energy I was going to develop and how much we were all going to do 'downstairs' she would never have consented."⁴

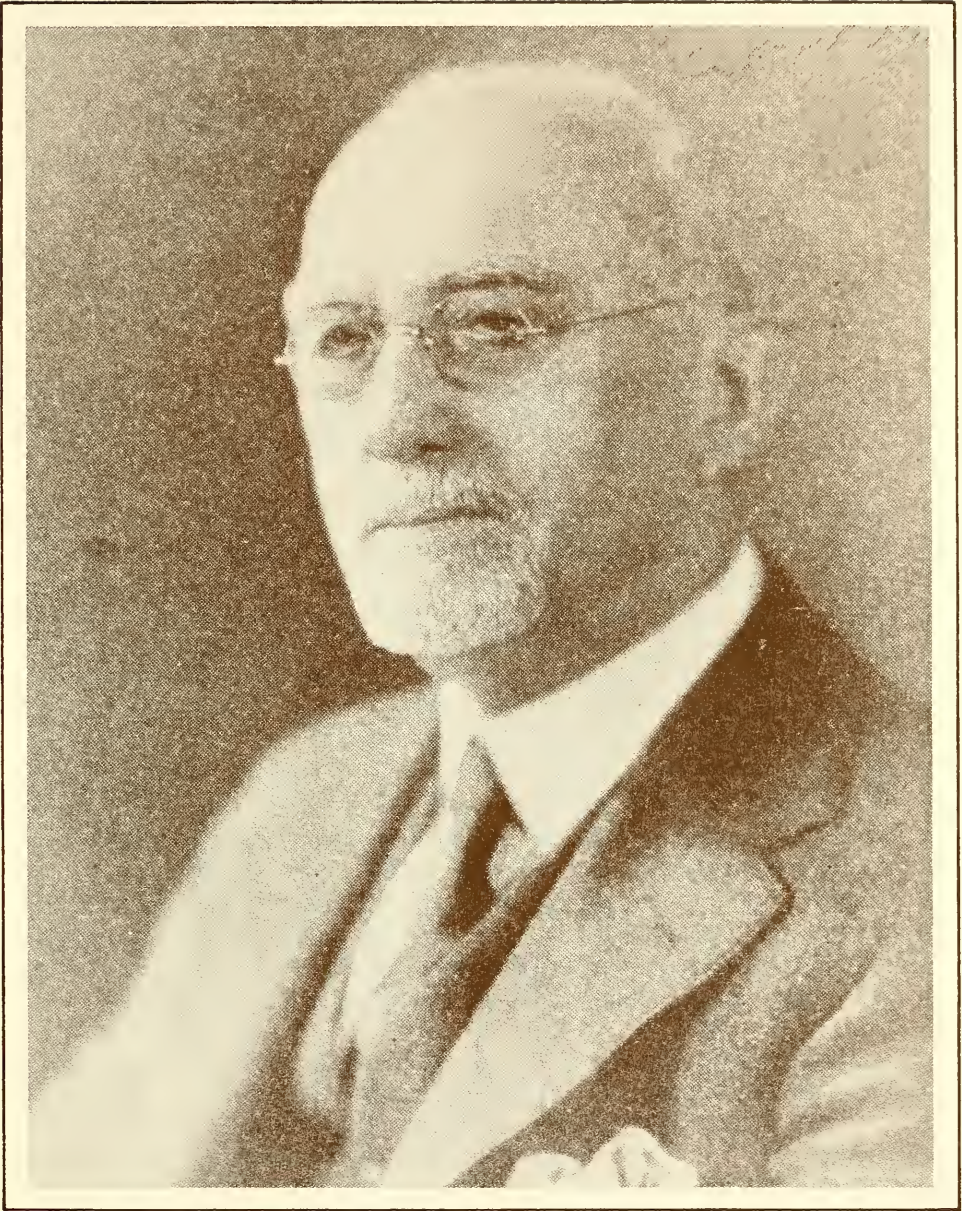
O'Dwyer began his research with great fervor, as if he had children of his own to save from the death grip of diphtheria. Northrup later noted: "Down in this cold corner O'Dwyer came constantly with devices which he wished to thrust into the larynx."⁵ O'Dwyer and Northrup, aided by retiring house physician R. E. Chadbourne, spent much time comparing healthy tissue to the false membrane typical of croup. In addition to his proficiency in medicine, Chadbourne happened to be a rather talented mechanic and he aided greatly in design of the various devices for intubation of the larynx.

The first models were made of simple "skeleton wire springs" which would press outward on the swollen pseudo-membrane. These gave way to a "small bivalve speculum, formed on the model of a bivalve vaginal speculum." O'Dwyer called them "springs." They were introduced while forcing the two valves together. When released, the spring would push the valves apart, which in turn pushed the false membrane apart, creating a passage for air. The device was held in place by a rubber collar on its top, which was wide enough to keep it from slipping down deep into the larynx. Chadbourne described the original equipment that was used in conjunction with the first live trial of the "springs": "I made it of a metal spiral catheter, the brass handle of a sink cock and the handle of a walking stick. The extractor was a long silver uterine ball-pointed probe bent so the ball would catch in the angle of the bivalve."⁶ One can imagine the primitive nature of this early equipment, which remained in use until a proper model could be crafted by a skilled instrument maker.

The first living case was far from the success O'Dwyer had hoped to effect. This first case, as recorded in the dead book of the New York Foundling Asylum, is described as follows:

October 21, 1882, Dr. G. M. Swift [reported a] female, aged four years. October 20th, severe croup; pseudo-membrane in pharynx; dyspnea urgent, temporary asphyxia; relieved by introduction into larynx by Dr. O'Dwyer of one of his springs. . . . Eight hours later, spring having been removed, the child again became asphyxiated. The subsequent history is: tracheotomy, death. . . . Autopsy: Pseudo-membrane in pharynx, larynx, trachea, and bronchi to finest bronchioles—continuous, tenacious, thickness of wet blotting paper.⁷

The disease had spread to the lungs. Tracheotomy in the first place would not have relieved the severe dyspnea coming from deep within the lungs. The child had no chance.



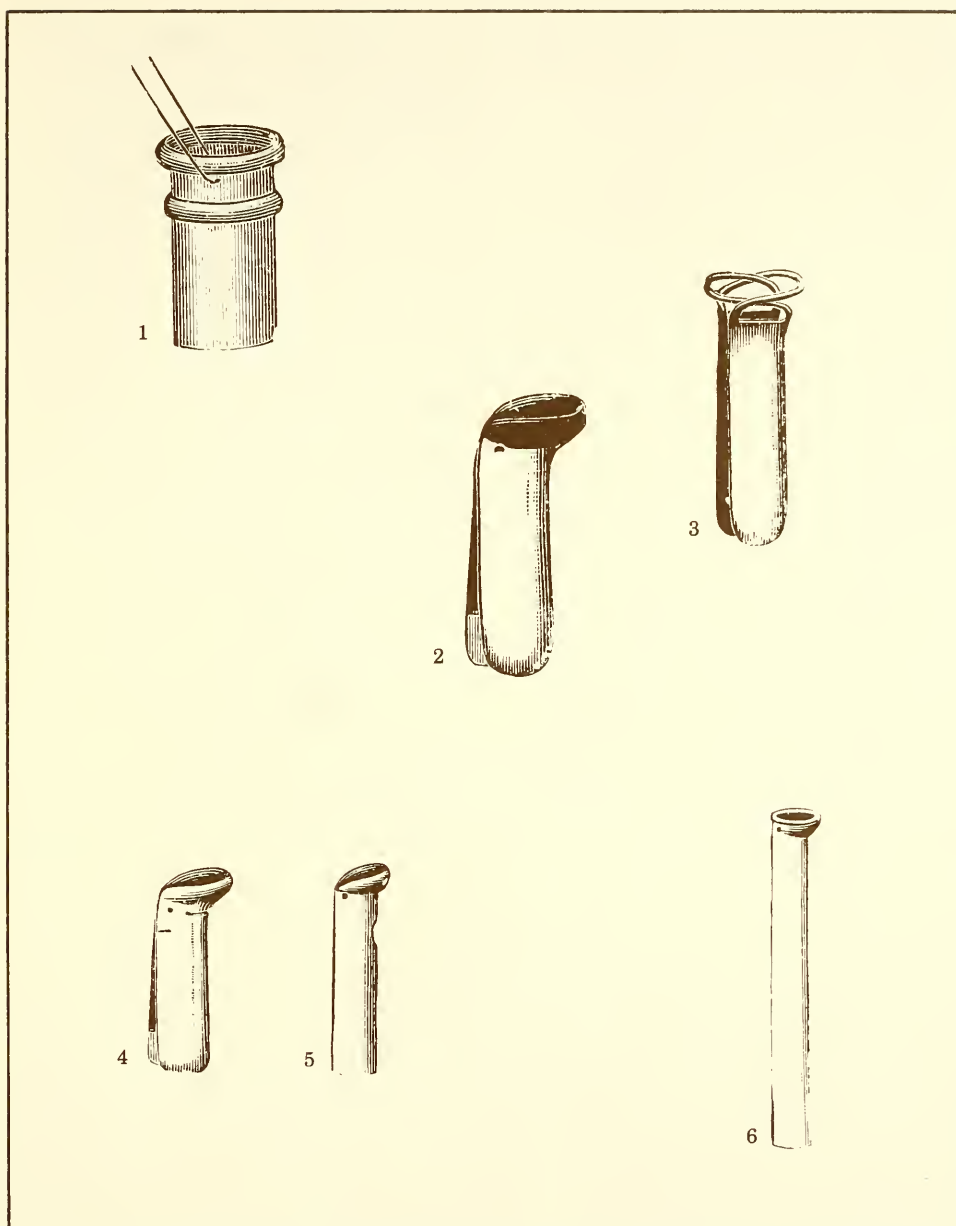
William Perry Northrup, M.D. (Photo courtesy of National Library of Medicine.)

Although the two subsequent cases met with similar results, they demonstrated that the larynx could tolerate the presence of a foreign body exerting pressure on the false membrane lining the healthy tissue. O'Dwyer was delighted to find that air could flow into the lungs while, at the same time, any of the false membrane that sloughed off could be coughed out. For all the apparent benefits, though, there were several great design flaws. The gap created between the valves when the spring expanded them allowed the false membrane to grow again, resulting in similar dyspnea. Also, the spring tension was difficult to set correctly. Leaving the spring too loose would render the device ineffective. Ulcerations, some quite serious, could result if the spring pressed too hard. The device also proved to be a great hindrance to feeding. A new model clearly was needed.

Happily, there was one triumphant recovery in the three-year use of the laryngeal bivalve speculum. This recovery was the first and only one logged in thirteen years of treating diphtheria at the New York Foundling Asylum.

The design of the new model began with the idea that a solid tube would be used, thus avoiding the problems caused by the gap between the valves. The first tube was longer than the "spring." It was narrow, oval, and rather flat, with a collar at the top. Where this model was first tried on April 24, 1884, its use resulted in the patient's death. In a second attempt with the device, the patient was a four-year-old girl, who recovered after an initial retention of the tube for sixty-seven hours, followed five hours later by three more days of retention. After this period, the child coughed out the tube and several weeks later her voice returned. After this first recovery with an actual tube, the name "intubation" became associated with the operation. The first recovery also led to the inclusion of a mouth gag as a standard apparatus in the intubation equipment. O'Dwyer had previously worn a finger guard but found limitations in such a device, since he was once held captive by a girl for fifteen minutes before she would relax her jaw and release his finger. As intubation became a more realistic alternative to tracheotomy, the finer points of the operation, such as using a mouth gag, were incorporated in the process.

Further examinations and conversations in the basement autopsy room led to one undeniable conclusion, as later recounted upon by Northrup: "Tracheotomy . . . was probably to have in intubation a competitor."⁸ The key word is "probably," as O'Dwyer implied when speaking of his first patients, under treatment from January, 1880 until December, 1885: "During the experimental stage of intubation, I operated on sixty-five cases of croup, sixty of them being in the New York Foundling Asylum, and had but nine recoveries, or not quite fourteen percent."⁹ The meager results of the combined use of both tube and spring necessitated further refinement of the tube.



*The progression in the design of intubation tubes includes Bouchut's 1858 model (Fig. 1) and the various forms subsequently designed by O'Dwyer (Figs. 2 through 6). (Illustrations reproduced from F.E. Waxham's book, *Intubation of the Larynx*, Chicago: Charles Truax, 1888, pp. 13, 16 and 17. Courtesy of the Dittrick Museum of Medical History.)*

In the early models O'Dwyer had used, a small slit on the top of the tube served as a fitting for the extractor. Healthy mucous membrane would grow into this slit as the patient returned to health and upon extraction, this embedded membrane would rip, causing a large sore. O'Dwyer eliminated the slit in his new designs. Next he dealt with the problem of the tubes being too easily expelled by coughing. To reduce this tendency, O'Dwyer lengthened the tube so that it nearly reached the bifurcation of the bronchi. With this modification, the tube would not be able to turn the necessary angle to be expelled if it rode up when the patient coughed. It might rise as high as the pharynx, but no higher.

O'Dwyer tried to avoid further movement of the tube by adding an abrupt ridge where the vocal cords could fit. He believed the cords would hold the tube in place. They did serve that purpose, but in fact worked too well. The cords locked too strongly into the groove, making extraction so difficult that the operator would actually cause temporary apnoea during extraction. O'Dwyer quickly removed this modification. Research progressed slowly but surely: there was a "long period of thinking, of measuring larynges, of modeling putty upon the middle of the tubes, and putting them into specimen larynges, of taking plaster casts."¹⁰

The result of this tedious process was a "retaining swell" in the middle of the part of the tube which extended into the trachea. The swell was molded to fit the epiglottis without causing ulceration of its tissues. O'Dwyer was also concerned about ulceration caused by the vertical motion of the tube which actually caused bare tracheal rings to be exposed as mucous membrane was rubbed away. The solution was to round the end of the tube so as to reduce the scraping that motion would incur.

These changes reduced the ulceration along the length of the tube except where the tube came in contact with the cricoid ring. As O'Dwyer had discovered, the cricoid ring is the smallest part, in diameter, of the entire airway. The only remedy for ulceration in this area was to reduce the calibre of the tube. O'Dwyer wondered if the tube could be made small enough to fit the cricoid ring without ulceration and still be wide enough to allow sufficient air flow to the lungs. The tube was reduced until ulceration would not occur, and then tried experimentally. Northrup recorded the good results: "It was found (what has been the marvel of everyone viewing the tubes for the first time) that a child could breathe perfectly through an exceedingly small tube."¹¹ O'Dwyer stated that the diameter of the tube could be halved and still allow adequate respiration.



An intubation tube (center) with silk thread attached and its appropriate obturator (left). When assembled for introduction, the rounded end of the obturator protrudes from the end of the tube, providing a blunt leading surface for the tube. The scale at right shows the age of the child and indicates the correct length of the tube for a child of that age. The tube pictured is the largest of the set. (Photo courtesy of the Dittrick Museum of Medical History.)



An intubation operation. Note the mouth gag and the blanket wrapped about the child to prevent interference from an uncooperative child. (Illustration reproduced from Intubation of the Larynx, p. 40. Courtesy of the Dittrick Museum of Medical History.)

Six years of changes and experiments led to a tube perfected for use. It could finally go into production by a skilled instrument maker. The first tubes were crafted by a German who worked well as long as O'Dwyer monitored him continuously, preventing him from dropping into a drunken stupor. Then he found George Tiemann and Company, a firm which agreed to make the tube exactly as he wanted. In 1887 an intubation kit made by this manufacturer sold for \$35.00. In 1898 Tiemann and Company was still the only firm making the tubes exactly as O'Dwyer had designed them.

The October 29, 1887 edition of *The Medical Record* featured an article in which O'Dwyer described his method for performing intubation.¹² This article coincided with the widespread marketing of the tubes. O'Dwyer first described the kit as containing five tubes, an obturator for each tube, an introducer, an extractor, a mouth gag, and a scale of years. The first step to intubation was for the operator, using the scale of years as a guideline, to select a tube of the correct length. A braided silk string eighteen inches long was then pushed through the small hole at the top and tied. The obturator matching the selected tube was screwed firmly to the introducer. The operator then slid this tube over the obturator until the rounded point of the obturator extended past the end of the tube. This rounded end prevented accidents such as tearing healthy membrane during insertion. With this done, the tube was ready for insertion.

As the child sat on the operator's lap, he was instructed to rest his head on the operator's left shoulder. The patient's arms were tied at his sides, thus preventing inevitable interference with the unpleasant operation. The operator placed the gag well back in the left side of the child's mouth. As an attendant held the head so that the chin was slightly elevated, the operator held the introducer ready in his right hand. He inserted his left index finger well down into the esophagus, raising the epiglottis to uncover the cavity of the larynx, at the same time holding his finger as far to the right as possible to allow easy clearance for the tube. The introducer was held along the chest and then raised up and away from the chest, so that the tube could be inserted. This procedure did not require force for insertion. (It was better to make a second attempt at insertion than to force.)

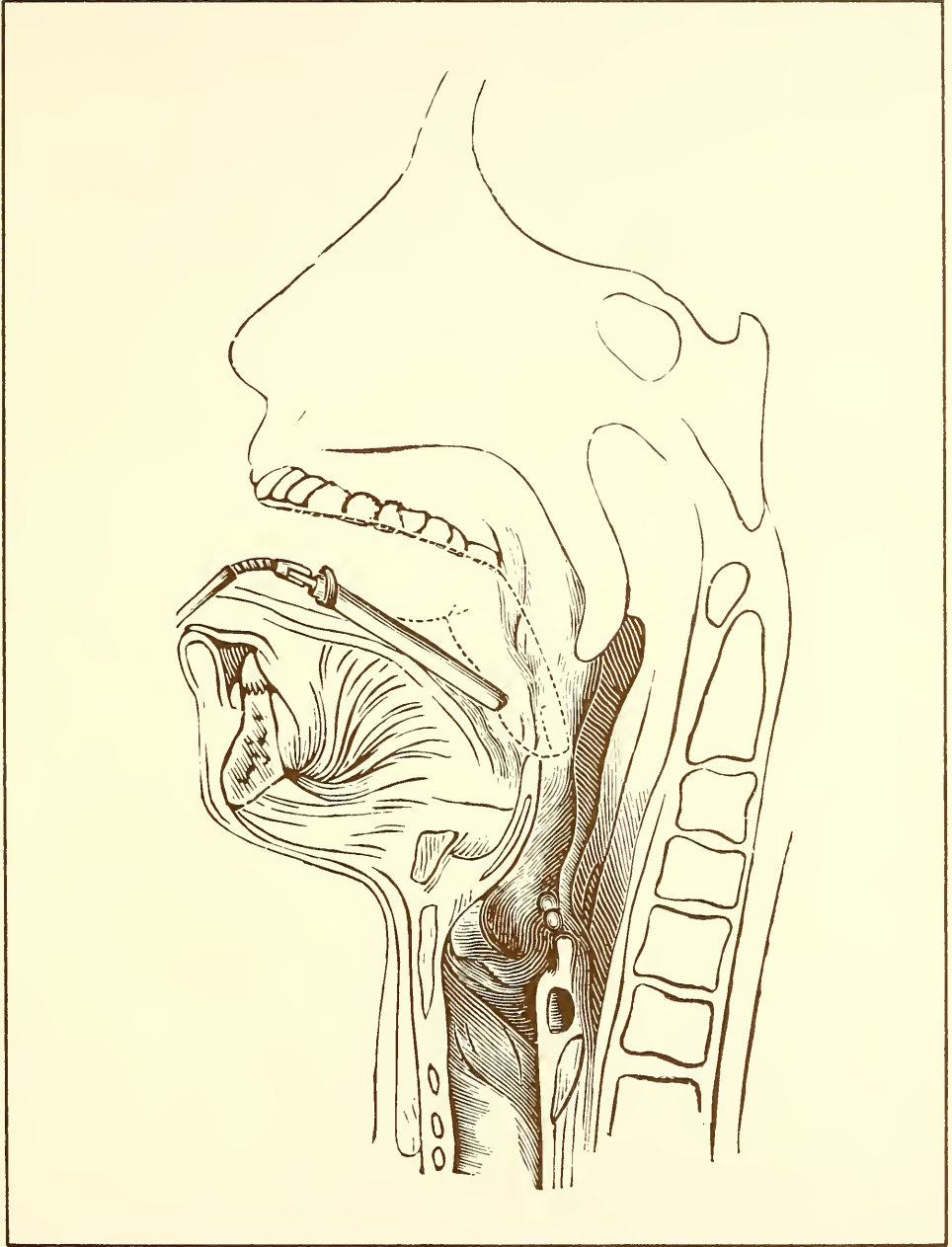
Once the tube had been inserted, the operator detached the introducer from the tube by sliding the small button on the introducer forward. He held his finger against the tube while removing the introducer to insure that the tube would stay in place. The string, still tied to the tube, served to irritate the larynx and cause coughing, which would begin to loosen the false membrane. The string could be removed once dyspnea had subsided. If there was reason to believe it might slip down and cause choking, the string could be tied around the ear.

Removal was performed with the child in the same position and the operator's left index finger in the same place. The operator used his finger to guide the extractor, positioning the tip of the extractor straight into the opening on the top of the tube. Pressing the lever extractor lever caused the tip to expand and grab on to the tube. The extractor was moved exactly in the reverse of the way the introducer had been. Force was unnecessary and detrimental to the process. Temporary dyspnea might occur from the inflamed mucous membrane meeting air for the first time. Such dyspnea would subside without treatment, although an antispasmodic, like cocaine in a gel, could be applied. O'Dwyer did not favor such treatment because it numbed the throat, reducing the coughing so important to the child's recovery.

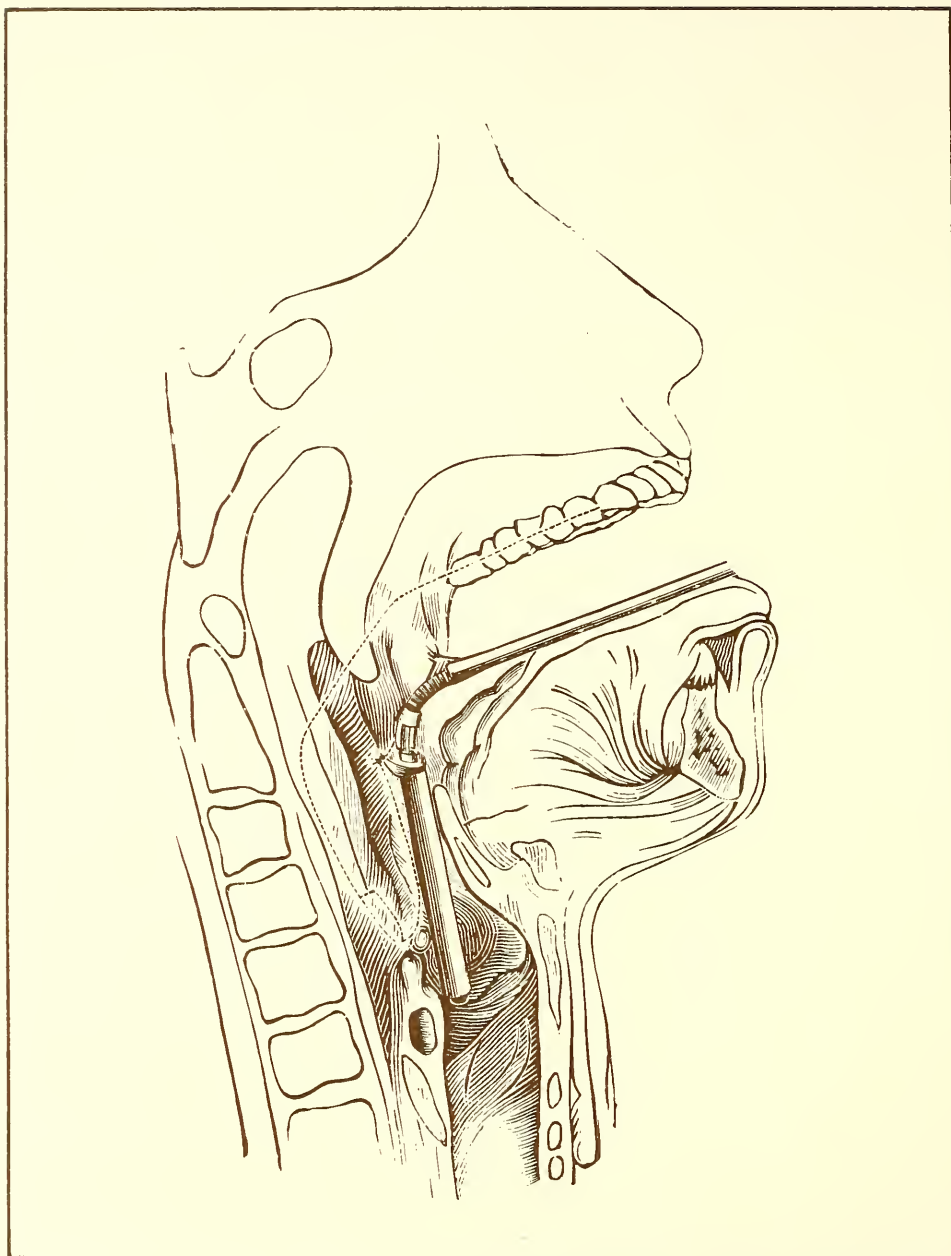
During retention of the tube, there was not much for the operator to do but monitor his patient for possible complications. The only supplemental treatments that O'Dwyer favored were the feeding of a milk and whiskey mixture, and if indicated, quinine suppositories. With favorable progress, the tube could be removed in about five days.

The first 50 cases treated with the new tube showed improved results. Over the period from December, 1885 to December of the following year, 38 of the 50 patients died. Eighteen of these deaths showed extension of the membrane into the bronchi. These 18 patients would not have recovered if a tracheotomy had been performed instead of intubation. Five others died of exhaustion. The 12 children who recovered had retained the tube for an average time of 5 days, 7 hours. Fifty more cases between November 16, 1886 and November 18, 1887 featured 8 recoveries of the 15 cases treated. O'Dwyer attributed these excellent results to treatment with bichloride of mercury in addition to intubation. Overall, the results to this point rivaled the results that performing tracheotomies would have produced.

With these results, one might be surprised by the antagonism of the tracheotomists.¹³ Detroit physician Charles G. Jennings had several reasons for preferring tracheotomy. He argued that, most importantly, tracheotomy facilitated removal of mucus and provided direct access for medication to effected areas. Jennings also believed nourishment was easier with tracheotomy. His own experience yielded 17 recoveries in 36 cases with tracheotomy, and 12 cases using intubation—with no recoveries. In addition, Jennings believed that the "personal equation is an important element in considering the comparative value of the two procedures." This matter of personal preference was supported by Dr. Max J. Stern of Philadelphia, who cited statistics to demonstrate the "comparative percentage of recoveries: Intubation, 26 [and] 2/5 percent; tracheotomy, 26 [and] 2/5 percent."¹⁵ The success of these operations varied, yielding favorable or unfavorable results depending on the physician.



Correct insertion of the intubation tube shows the tube being guided past the epiglottis by the forefinger. (Illustration reproduced from Intubation of the Larynx, p. 41. Courtesy of the Dittrick Museum of Medical History.)



*The final maneuver of introducing the tube involves using the forefinger to position the tube into the larynx. (Illustration reproduced from *Intubation of the Larynx*, p. 46. Courtesy of the Dittrick Museum of Medical History.)*

Generally, most physicians had the opinion of Dr. Max J. Stern, who believed that intubation should always be used on very young children, of ages three and a half and younger. According to statistics, the younger the child the less chance of survival with tracheotomy. Intubation on children in this age group yielded results similar to the survival rates of older children with tracheotomies. Some physicians felt that intubation should be performed on every case of croup regardless of age. Dr. W. F. Brook, surgeon at Swansea General Hospital in England, argued for intubation with this reasoning: "One never dreams of puncturing the bladder before attempting catheterization, so in the vast majority of cases . . . I attempt intubation before proceeding to tracheotomy."¹⁶ Many physicians found that with practice intubation worked as well as, or better than, tracheotomy, and without all the complications associated with the open wound.

O'Dwyer had hopes of public support for intubation because it required no cutting, which meant that more parents might allow intubation rather than simply refusing tracheotomy, if only to allow their children to die in peace. Arguing for intubation, O'Dwyer insisted: "The question is not which will save most life in a given number of cases submitted to treatment, but which operation can be performed or will be permitted in the greater number of cases."¹⁷

Many doctors concurred with O'Dwyer's argument in favor of intubation over tracheotomy. One such physician was Dr. F. E. Waxham, who listed intubation's "many advantages over tracheotomy. It can be done almost instantly. There is no loss of blood, no pain, no shock, no open wound with the possibility of septicaemia or erysipelas. There is no drying of mucus in the tube, and no necessity for cleansing the tube. Less attention is required after treatment."¹⁸ This attitude was shared by a great many of O'Dwyer's adherents.

Admittedly, the patients of many doctors died while being treated by intubation. Most critics of intubation were quick to attribute these deaths to insertion of the tubes. The truth was that the disease was fatal with any method of treatment if the pseudo-membrane had spread too far into the lungs for dyspnea to be relieved even by tracheotomy.

Proponents of intubation cited inexperience as the major reason why opponents argued for performing tracheotomy instead of intubation. Montreal practitioner A. D. Blackader reported that in his area, only a few doctors knew how to perform intubation skillfully. For this reason, all cases indicating the use of intubation were sent to these doctors, thus increasing the percentage of recoveries. The tragedy accompanying inexperience was

cited by Dr. Northrup, who told of one particular example in which "some man had bought a set of his [O'Dwyer's] instruments, rushed to a case, inserted the tube, and the patient died at once. Presumption was the tubes were not only useless, but had killed the patient. Mind you, practice on the cadaver the operator had not had."¹⁹

O'Dwyer's own success in performing intubation can be attributed to experience gained during his years of practice with the imperfect models even before he had access to the highly refined models that were being marketed. Others who merely experimented with the tubes on a few patients, not surprisingly, had few recoveries.

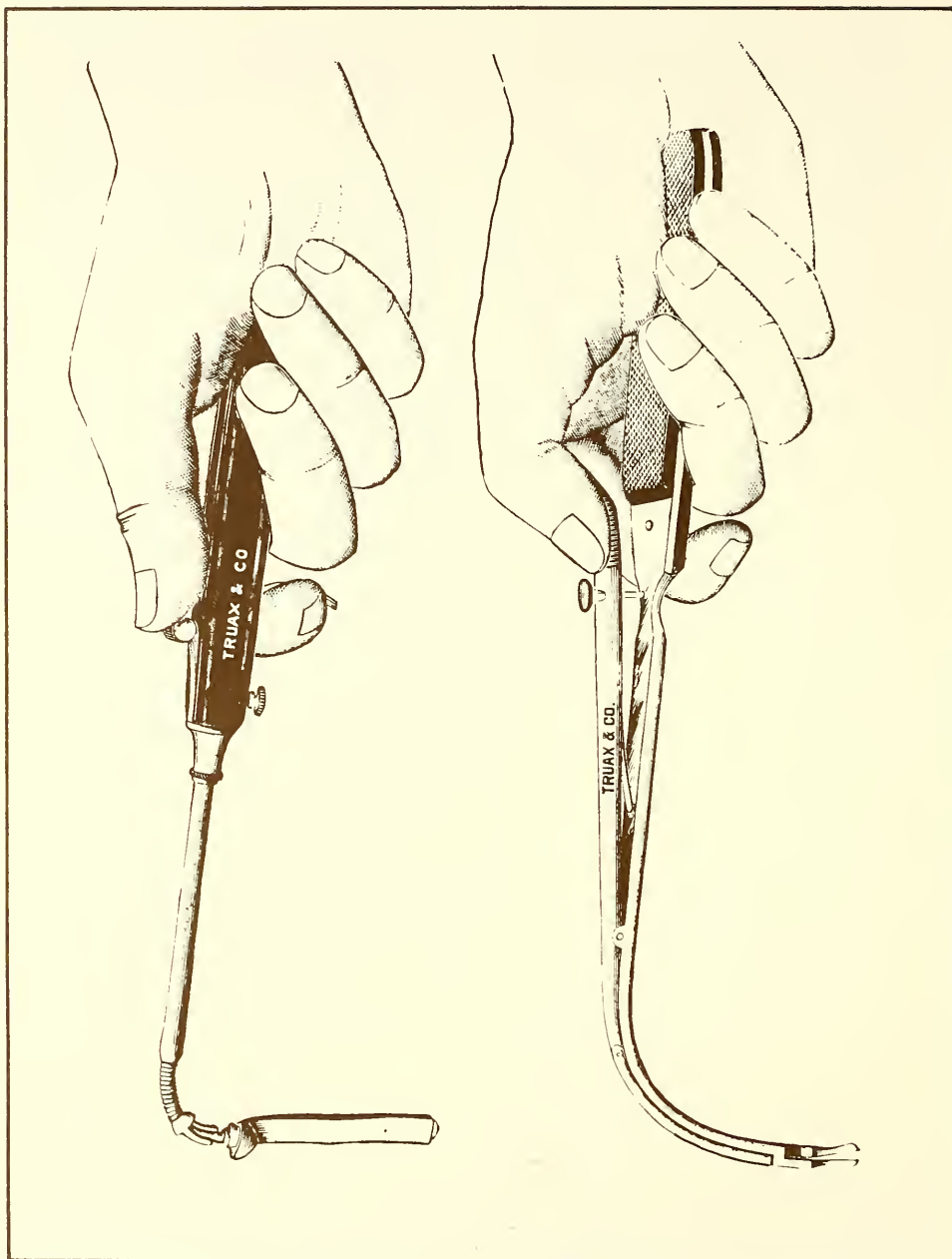
The errors commonly committed by inexperienced intubators and suggestions for ways of avoiding these errors were frequent topics addressed by writers in the medical press. O'Dwyer himself wrote some of the articles suggesting methods to improve the safety of intubation. At one point he pointed out to his fellow practitioners: "Some of the following accidents that occur in practicing intubation of the larynx are avoidable, and are due to want of practice on the cadaver. These will diminish as the operation grows older, and a greater number acquire proficiency in performing it."²⁰

One of the principal signs of inexperience was the apnoea which could result from prolonged efforts to insert the tube. O'Dwyer noted an experienced operator could intubate in ten to fifteen seconds. Tubes too small in width were being inserted, with the result that the patient died some hours later when the tube disappeared down the airway. A moment to verify the correct fit of the tube would have saved these lives. Nervousness, often an accomplice of inexperience, was a reason some doctors inadvertently caused the deaths of their patients. There are reported cases of tubes having been forced through the existing tissue of the esophagus, creating false passages into which tubes were placed. At the time of operation, death supposedly occurred when the false membrane was forced down into the lungs, rather than having pierced a hole in it. (Some practice on a cadaver would have been beneficial to these inexperienced doctors.)

Inexperience also led to complications during the process of extraction. Several doctors apparently had forced extractors down past the tubes and into the larynx. When an inexperienced doctor pushed the lever and pulled up, the expanded tip of the extractors would sever the vocal cords and break the cartilage of the cricoid ring. The broken cricoid ring then allowed the tube to drop deep into the airway, causing much more serious problems. An experienced intubator would know how far down the extractor would have to go to grab the tube. (To reduce the chance of this type of accident, by October of 1887 O'Dwyer had added a regulating screw to the extractor model, so that



During the extraction, the lever on the extractor is pushed to expand the jaws in the top of the tube, causing a tight grip on the tube. (Photo courtesy of the Dittrick Museum of Medical History.)



The correct handling of the two main apparatuses of intubation: the introducer (left) and the extractor (right). (Illustration reproduced from Intubation of the Larynx, p. 36. Courtesy of the Dittrick Museum of Medical History.)

the tip would open only enough to hold the tube and not cause undue damage if the operator missed the tube.)

Another sign of inexperience was an ignorance of the possibility of encrustation inside the tube from secretions of the false membrane. Many children died from asphyxia caused by such encrustation, despite the publication of several articles describing warning signs. O'Dwyer suggested that loss of a forceful cough would indicate some partial obstruction inside the tube. Such a circumstance should spur removal and examination of the tube for encrustation. New York physician Dillon Brown pointed out that faithful monitoring of the child was the best way to avoid this and other problems. He also advocated the use of a steam atomizer, which seemed to reduce the incidence of encrustation. If some of these inexperienced doctors had taken time to analyze the cause of their patients' deaths, they would have found themselves—and not the intubation process—to have been the ultimate factor in the cause of death. Instead, they flippantly wrote off intubation as deadly.

Several rare accidents could occur even for the most experienced of intubators, including for O'Dwyer himself. One such unavoidable problem concerned a condition termed "dry croup," which was characterized by very little coughing. The most serious annoyance was removing the tube and checking for encrustation, only to find the tube as clean as when inserted. Another more serious complication was the possibility of the tube suddenly becoming obstructed by large amounts of sloughed false membrane. In such circumstances, the child usually coughed out the plugged tube, but several cases were reported of children having died from asphyxiation. In all probability, careful monitoring would have reduced the incidence of death from this complication. False membrane could also dislodge during insertion and be forced down to the lungs, causing asphyxiation. Despite the everpresent possibility of such clogging of the tube, it happened to O'Dwyer only once in 136 patients.

The most exasperating of all complications was that caused by more resourceful youngsters. Occasionally, upon the operator's attempts at extraction, no trace of the tube could be found. These mysteries were often resolved when the tube would be found a short distance away, hidden in a corner, after the child had coughed it out and hidden it. On one occasion, the tube reappeared in normal digestive excretion some days later. There was no way to prevent a child from removing the tube if he really was determined not to have it in his throat.

O'Dwyer felt a great deal of anxiety because of his attempts to save lives. All criticism about intubation came directly to him, and he took each one of them as a personal attack. He worried and fretted over every death and mishap reported. As if the myriad of criticisms were not enough, he had to worry about instrument makers producing inferior intubation kits. With the exception of the product marketed from Tiemann and Company, the kits produced by other instrument makers had been designed for easy manufacture, with no concern for all the subtle modifications O'Dwyer had made so carefully and which made the whole concept of intubation feasible. As it became more apparent to O'Dwyer that many of the kits being produced were not as he had intended, he decided to see for himself just what was being manufactured. On a trip to London, O'Dwyer commissioned Northrup to purchase a kit from one of the leading instrument makers in Europe. What Northrup brought back only added to O'Dwyer's anxiety. He anguished that the kits were a "travesty. They embodied every vice. There was only one way they could be made worse, and that was by indenting the cutting edges like a buzz saw. They would be ludicrous, were they not cruel."²¹

Some of these horrifying modifications apparently were being suggested to the manufacturers by physicians who knew little or nothing about intubation. O'Dwyer constantly worried over every facet of intubation. His dedicated work on intubation was being devastated unknowingly by fellow physicians.

Then, as if the concerns about his work were not trying enough, O'Dwyer's wife died only two years after intubation had been widely introduced to the public. She had been his most avid supporter. O'Dwyer had needed the quiet home life she offered him as at least some respite from the anxiety caused by his work. With her gone, he became mentally exhausted, finding no shelter from his great concerns. His young sons offered little consolation for her absence. As Northrup described, "intubation destroyed [O'Dwyer's] ability for good sleep, it broke his health, it made him prematurely old."²²

The major drawback to intubation, agreed upon by both opponents and proponents, was that of feeding. Many physicians believed that liquids flowed past the tube and into the lungs, causing a usually fatal case of pneumonia. Others simply saw feeding as yet another motivation to perform a tracheotomy in all cases. The alternative was rectal alimentation, which the patient would not find very pleasant. This problem brought O'Dwyer the most grief.

He believed the causes of pneumonia were not directly related to intubation. Often, the membrane itself would spread to the lungs, causing pneumonia



A tube and its appropriate obturator attached to the introducer, ready for insertion. The knob on the introducer is pushed forward to release the tube from the obturator. Note the silk thread that would be tied to the child's ear after placement of the tube. (Photo courtesy of the Dittrick Museum of Medical History.)

MOUTH AND THROAT INSTRUMENTS.

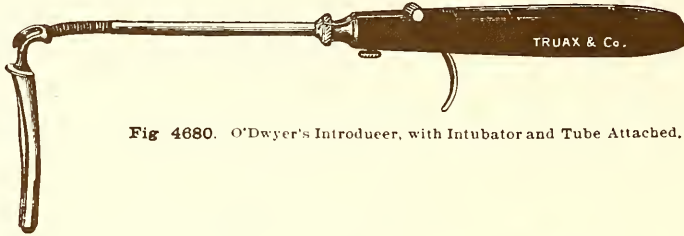


Fig. 4680. O'Dwyer's Introducer, with Intubator and Tube Attached.

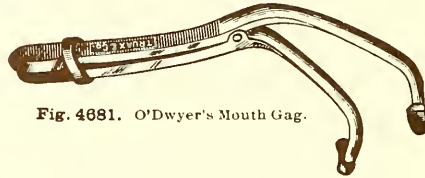


Fig. 4681. O'Dwyer's Mouth Gag.

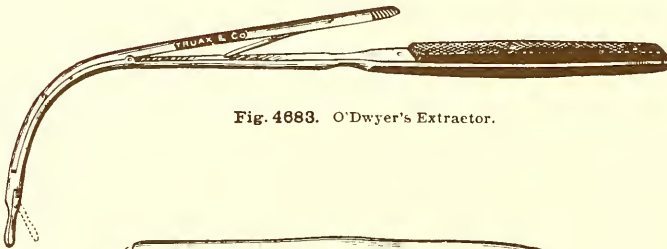


Fig. 4683. O'Dwyer's Extractor.

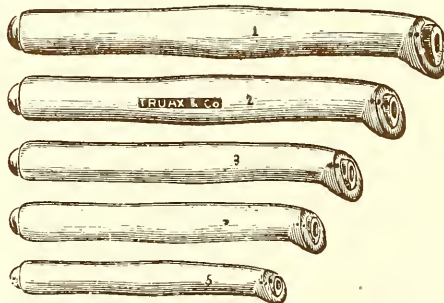


Fig. 4684. O'Dwyer's Intubation Tubes, per set, \$10.00.



Fig. 4686. O'Dwyer's Scale for measuring the Tubes to assist in selecting the proper size.

Mouth and throat instruments devised by O'Dwyer as advertised in the Price List of Physicians' Supplies, Chicago: Charles Truax, Green & Co., 1893, p. 1294. (Photo courtesy of the Dittrick Museum of Medical History.)

from the subsequent secretions. O'Dwyer also thought that liquids probably were passing down past the tube, but he theorized that the reduction in the calibre of the airway reduced the explosive quality of the cough which would normally expel any liquid passing down into the trachea. From his research O'Dwyer concluded that the blood flow to the lungs was increased during a bout of diphtheria because of the vacuum created by the reduced and labored air flow. This blood might be causing the pneumonia. Northrup's own work concurred with O'Dwyer's theories. Based on examinations he performed at the New York Foundling Asylum, Northrup stated: "After all that has been suggested on the subject, I find no evidence that milk, or food of any kind, has passed into the finer bronchi and alveoli of patients wearing the laryngeal tube."²³ Apparently, O'Dwyer's hypothesis was quite correct that the tube was not causing the pneumonia.

O'Dwyer and others deduced that the discomfort caused when a patient with the tube drank could be reduced by modifying the tube shape. Until modifications in the tube design could be made, temporary relief was offered by Dr. Casselberry of Chicago, who suggested that patients should swallow "uphill." This practice would cause liquid to flow out of the airway by gravity, and not be trapped—thereby preventing the possibility of pneumonia. O'Dwyer also told his patients to drink rapidly as much as they could all at once and then cough so as to expel any liquid that passed the tube. Ultimately, O'Dwyer found a remedy for this problem and his patients could expect safe, comfortable drinking.

Research in the autopsy room (which by this time was far better equipped than in 1882) led to further modifications of the tube. These modifications were designed to combat complications which could cause pneumonia. The tube now had a larger head which filled the cavity of the larynx. A backward curve on the top of the tube reduced ulceration on the epiglottis. In turn, this modification lessened the possibility of liquid flowing past the imperfect seal of an ulcerated epiglottis. O'Dwyer also lengthened the posterior of the tube, allowing the epiglottis to come in contact with the tube sooner and with greater pressure, thereby allowing a more natural operation of the epiglottis. He also made the head more concave. In theory, this change should have been for the better, allowing a better seal by the epiglottis. Unfortunately, it never proved to be greatly beneficial for that purpose. Instead, this modification quite unintentionally made the task of finding the hole in the top of the tube with the extractor much easier, in that any contact would lead "downhill" toward the hole. These modifications slowed the criticism, and did seem to make feeding more comfortable for patients. During this period, O'Dwyer also developed a set of membrane extractors to be used prior to intubation, but they never went into widespread use.

It seemed finally as if O'Dwyer had been able to quiet the opposition, and thereby ease his own anxiety. However, just at this time, antitoxins were being developed, tested and proven effective. Studying the ramifications of this medical advance, O'Dwyer foresaw an impending decline in demand for his intubation expertise and for diphtheria consultations.²⁴ Calomel inhalations in their first trials were 55 to 60 percent effective in curing diphtheria—a success rate which was nearly double the effectiveness of tracheotomy or intubation. All his work was being phased out by the new chemical treatments becoming available for use.

Even though the need for intubation in treating diphtheria had dropped considerably, O'Dwyer's work did not immediately fade into the annals of medical history. He went on to develop a method, using tubes similar, but larger than his intubation tubes, for treating chronic stenosis of the larynx due to scar tissue. The procedure consisted of excising scar tissue usually caused by a previous tracheotomy, inserting a tube and allowing the tissue to heal around it. By increasing the calibre of this tube over several weeks, the scar tissue would expand and not grow back. Although periodic treatment over several months usually was necessary, the dyspnea would eventually be cured. In December of 1885, the first patient was treated with nine tubes over a period of eighteen days. Treatment continued over fifteen months. This procedure could also be used for removal of retained tracheal cannulas.

O'Dwyer never got a chance to pursue additional modifications. At age fifty-seven, he died on January 7, 1898 in his Lexington Avenue home. He continued his research until the end. His last improvement was hard rubber tubes, which allowed easier cleaning, and reduced the encrustation of the metal tubes. At the time, he was one of the best known doctors in New York. Northrup eulogized that intubation stood as O'Dwyer's "undisputed monument."²⁵ Although he died with no material wealth, O'Dwyer's son Joseph Jr., was offered a full scholarship to Columbia College in his father's honor.

Northrup eulogized his friend and co-worker Joseph O'Dwyer with these words: "What the world knows of this man are his genius as an inventor, his achievement in adding to the equipment of a profession a great operation; he made the most conspicuous real contribution to medical progress within the past fifty years."²⁶

This conspicuous contribution came to be associated with his name through no doing of his own. Every pediatrician and many other doctors owned an "O'Dwyer Intubation Kit." The medical community in general had honored him in this way for his tireless research in intubation—a loving and devoted

MOUTH AND THROAT INSTRUMENTS.

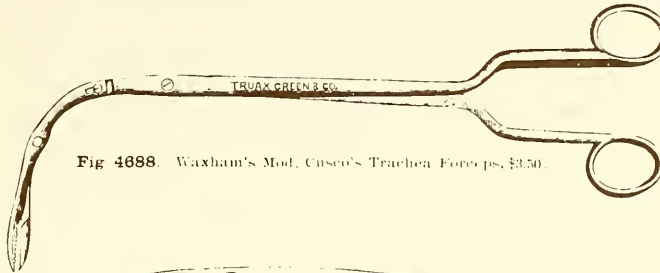


Fig. 4688. Waxham's Mod. Cusco's Trachea Forceps, \$3.50.

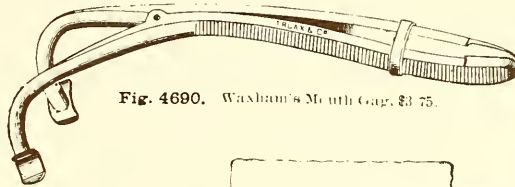
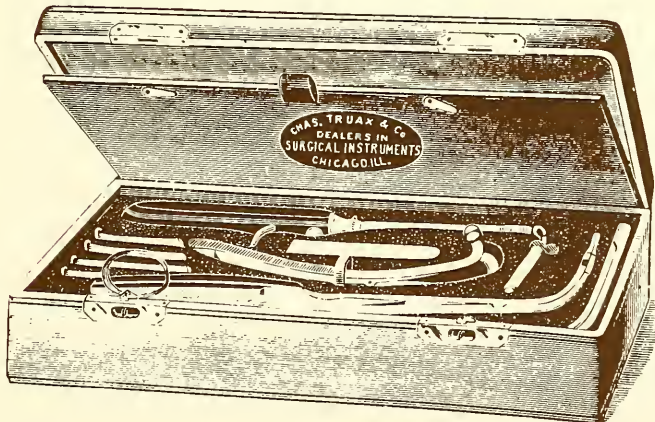


Fig. 4690. Waxham's Mouth Gag, \$3.75.



Fig. 4691. Waxham's Respirator.



Advertisement for Dr. Waxham's mouth and throat instruments from the Price List of Physicians' Supplies, p. 1295. (Photo courtesy of the Dittrick Museum of Medical History.)

endeavor which eventually cost him his life. At a time when he could have made a great name for himself, O'Dwyer's peers did it for him.

Joseph O'Dwyer had worked on intubation for eighteen years, only to find his achievements phased out by the more effective antitoxins developed in the early 1890s. Intubation, that "most conspicuous real contribution," is now nothing but a memory known to few. O'Dwyer bridged the gap between crude palliative cures such as tracheotomy and chemical "magic" which supposedly cured almost all cases. At the time, he was perhaps the most prominent man involved in diphtheria research. A scant few years later, he was a memory to some, and completely unknown to most. In the 1880s and early 1890s, not a journal issue in New York City appeared without some mention of his work on intubation, either in the form of an article by O'Dwyer himself or by one of his colleagues. Although O'Dwyer truly had been one of the best known medical men of his day, his achievements passed rapidly into obscurity a few years after he succumbed to mental and physical exhaustion.

Ironically, O'Dwyer discovered a fact that ultimately could have brought him more public recognition than that attained by any other of his contemporaries in the medical profession. Today everyone has heard of Dr. Heimlich and his anti-choking maneuver, which is credited for saving many thousands of lives. Apparently, O'Dwyer had stumbled on to nearly the same idea. In one of his papers, he related how to effect the expulsion of false membrane and the "extrusion of foreign bodies from the larynx."²⁷ He suggested a method for expulsion strikingly similar to that of Heimlich, in order to avoid hitting the child on the back: "This is accomplished by placing the patient across the knees, on the floor, table, or other hard surface, and, while with one hand firm pressure is made on the abdomen to prevent descent of the diaphragm, the other hand, open, is brought down with considerable force on the front of the chest."²⁸

This information is buried amidst one of O'Dwyer's many papers on intubation. Such a method, if it had become more widely recognized, would have saved thousands of more lives than did intubation, which had achieved a great success in its own right. In any case, the story of Dr. Joseph O'Dwyer provides information about an all but forgotten contribution to the rich history of American medicine.



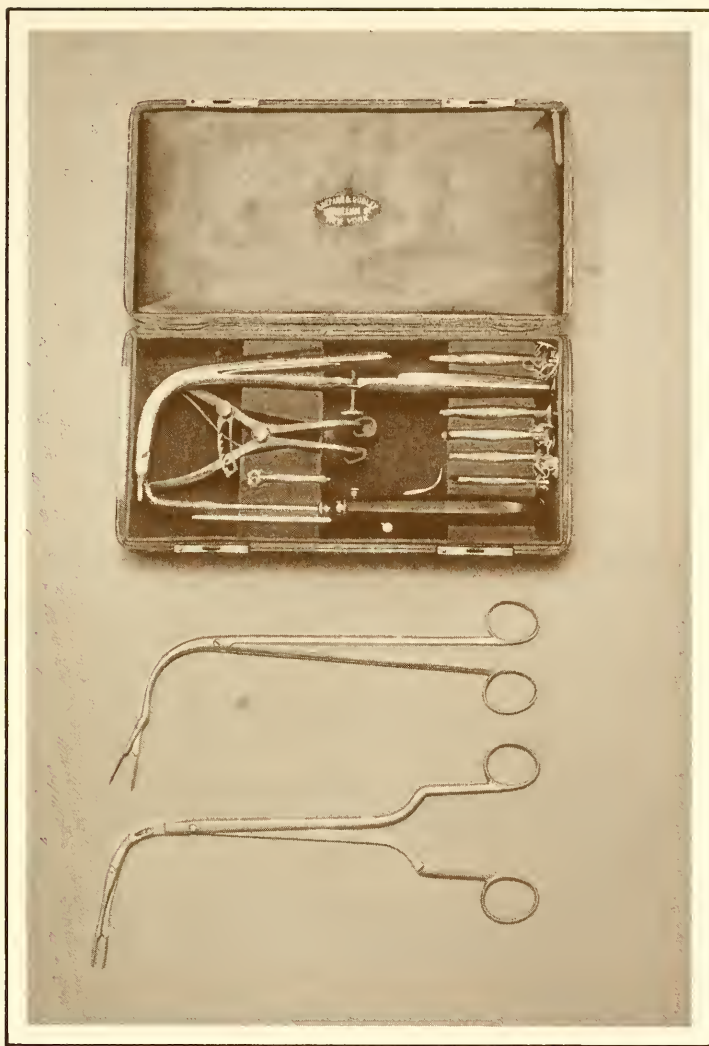


Fig. 1. Intubation set, circa 1890. Black leather case with nickel-plated sliding locks. The interior of the case is lined with red satin and velvet. The interior lid has an oval leather label, stamped in gold, with these words: "SHEPARD & DUDLEY, 150 WILLIAM ST., NEW YORK." From front to rear: nickel-plated introducer with hard rubber handle; nickel-plated mouth gag (Denhard's) with red rubber tubing on the jaws; nickel-plated extractor with hard rubber handle; nickel-plated scale, calibrated 1-10; six gold-plated intubation tubes with white metal obturators and silk string threaded through holes at the top of each tube.

Fig. 2. Laryngeal forceps (Cusco's), circa 1900. Nickel-plated; stamped, "SHEPARD & DUDLEY," 21 cm. in length.

Fig. 3. Laryngeal forceps (Cusco-Waxham's), circa 1890. Nickel-plated; stamped with Kny-Scheerer trademark; disassembles into three parts. (Photo courtesy of the Dittrick Museum of Medical History.)



Intubation equipment circa 1920. Top: Chamois cover with metal frame and clasp. Bottom: Chromium-plated case with clasp. The exterior lid is stamped with the Kny-Scheerer trademark and marked "J.F. HARTZ CO." The interior lid contains a chromium-plated introducer and extractor. The interior base holds seven hard rubber intubation tubes with chromium-plated long stem obturators and mouth gag (Denhard's). Two flat straps keep the instruments in place. (Photo courtesy of the Dittrick Museum of Medical History.)

APPENDIX

As the use of O'Dwyer's intubation sets became more widespread, adaptations and additions to the standard set were made by other doctors who had gained considerable experience in intubation. Many of these changes were of little advantage in aiding the ease of the operation or the comfort or well-being of the patient, and thus were never included in the intubation sets offered for sale by instrument makers.

Some modifications were definite improvements, however, and soon became standard features of the sets. Of these changes, the most widespread was the adoption of a new type of mouth gag. O'Dwyer's original mouth gag was a two piece, hinged tool, much like a pliers, which widened as the hand grips were pressed together. The gag was held widened in the child's mouth by a ring that slid down the hand grips, locking them closed and the gag open. The newer gags had a different locking mechanism—involving a small catch much like today's surgical clamps—which did not require further widening of the gag to release the device which held it open.

Another notable change occurred in the design of the obturators. The original obturator screwed onto the introducer just at the right angle bend in the neck of the introducer. Newer sets had obturators which, still one for each size tube, had a right angle bend and a long neck, which fit into a hole in the introducer handle. These new obturators were held tightly in place by a thumbscrew on the underside of the introducer handle. This modification afforded easier assembly and disassembly of the introduction unit and also eliminated the exposed screw threads which were much more difficult to clean and sterilize.

The one addition to the set that became a standard feature in some manufacturers' trade catalogues was a laryngeal forceps. Many doctors, including the developer of the new tool, Dr. F. E. Waxham of Chicago, had noted cases in which introduction of the tube forced already loosened croupous membrane down into the larynx. The displaced membrane tended to form a seal on the bottom of the introduced tube, resulting in immediate asphyxia and necessitating speedy removal of the tube. The operator then would have to remove the membrane manually, a difficult task with a child terrified from momentarily losing the ability to breathe. The forceps used had

two hinged joints below a right angle turn on the long neck of the instrument. The two hinges allowed the jaws of a small toothed clamp to open and close at the end of the forceps without requiring any part of the instrument to open wide in the throat or mouth of the patient. A smooth, scissors-like action from the operator was enough to grip and easily remove the displaced membrane without causing undue discomfort to the child. The tool went through several minor changes, making the clamping mechanism much easier to operate by requiring only very small scissor movements by the operator. When not actually included in the set, many manufacturers offered some form of these forceps as an accessory to the basic set.





NOTES



1. "The Early History of Intubation of the Larynx," *The Medical Record* 31 (1887):73.
2. W.P. Northrup, "Memorial Address on Joseph O'Dwyer, M.D.," *The Medical Record* 53 (1898):361.
3. *Ibid.*, 364.
4. W.P. Northrup, "Joseph O'Dwyer, M.D.: His Methods of Work on Intubation; The Measure of His Success; The Interest of Both to Young Graduates," *The Medical Record* 65 (1904):562.
5. *Ibid.*, 562.
6. *Ibid.*, 563.
7. Northrup, *Medical Record* 53 (1898):362.
8. *Ibid.*, 362.
9. Joseph O'Dwyer, "Fifty Cases of Croup in Private Practice Treated by Intubation of the Larynx, with a Description of the Method and of the Dangers Incident Thereto," *The Medical Record* 32 (1887):557.
10. Northrup, *Medical Record* 53 (1898):362.
11. *Ibid.*, 363.
12. O'Dwyer, *Medical Record* 32 (1887):

13. Northrup, *Medical Record* 65 (1904):564.
14. Charles G. Jennings, discussion, *The Medical Record* 32 (1887):318.
15. Max J. Stern, "Intubation or Tracheotomy," *The Medical Record* 32 (1887):382.
16. Joseph O'Dwyer, "Intubation of the Larynx," *The Medical Record* 32 (1887):382.
17. F. E. Waxham, "Intubation of the Larynx, Its Advantages and Disadvantages, with Statistics of the Operation," *The Medical Record* 32 (1887):318.
18. W. F. Brook, "Sections of Laryngology and Otology and Diseases of Children: VI," *British Medical Journal* 2 (1894):1481.
19. Northrup, *Medical Record* 65 (1904):564.
20. O'Dwyer, *Medical Record* 32 (1887):560.
21. Northrup, *Medical Record* 53 (1898):363.
22. *Ibid.*, 363-364.
23. W. P. Northrup, "Pathological Anatomy of the Respiratory Tract after Death from Laryngeal Diphtheria and Intubation," *The Medical Record* 31 (1887):687.
24. Northrup, *Medical Record* 65 (1904):561.
25. *Ibid.*
26. Northrup, *Medical Record* 53 (1898):364.
27. Joseph O'Dwyer, "Analysis of Fifty Cases of Croup Treated by Intubation of the Larynx," *New York Medical Journal* 47 (1888):36.
28. *Ibid.*



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AUTHOR

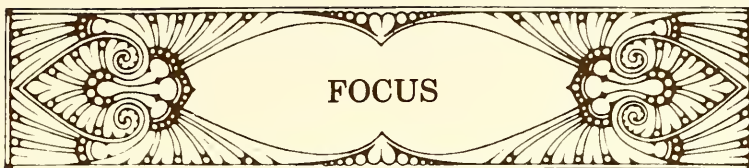


Craig Alan Gelfand is currently in his third year as an undergraduate student of biochemistry at Case Institute of Technology at Case Western Reserve University in Cleveland, Ohio. He hopes to complete his education with a joint M.D./Ph.D. degree in biochemistry. In the spring of his freshman year, Mr. Gelfand enrolled in a class titled the "History of Medical Technology," taught by Dr. James Edmonson, curator of the Dittrick Museum. The grade for the class was based solely on the final paper, the topic of which, for Mr. Gelfand, was Dr. Joseph O'Dwyer and his intubation tubes. With encouragement and aid from Dr. Edmonson, the paper was reworked into a form suitable for journal publication. The accompanying pictures and photographs were obtained from the collections of the Dittrick Museum and the resources of the Allen Library of the Cleveland Medical Library Association.





Museum-Foyer. Foreground: Mrs. Bernice Jackson, Rare Book Librarian. Background: Mrs. Lena Downing, Administrative Assistant. (Photo courtesy of Clendening History of Medicine Library.)



The Clendening History of Medicine Library and Museum

Robert P. Hudson

The Clendening Library contains over 22,000 volumes in the history of medicine, to which between 600 and 1000 new volumes are added each year. The Clendening Library houses special collections in radiology, hematology, plastic surgery and anesthesiology. Dr. Logan Clendening was a Kansas City, Missouri, internist and a professor at the University of Kansas School of Medicine. He was born in 1884 and died in 1945. In 1927 he published the *Human Body*, a volume which became a national bestseller. Thereafter he became one of the earliest successful health columnists. His articles had a combined circulation of over 25 million during the Depression and early 1940s. Clendening's collection included most of the important first editions in the history of medicine and was bequeathed to the University of Kansas Endowment Association upon his death in 1945. The efforts of the history of medicine department were furthered by a bequest from Dr. Clendening's widow, the late Mrs. Dorothy Hixon Clendening Clark.

The Jager Collection is housed in a separate room and focuses on cardiology and pathology, the latter including manuscripts and correspondence of Rudolf Virchow. Dr. Thor Jager was a practicing internist in Wichita, Kansas, who also had an appointment at the University of Kansas Medical Center. He and Clendening were friendly competitors in the quest for appropriate items in the history of medicine. Jager's books were donated to the Kansas University Endowment Association in 1970.

The entire library and museum occupies newly renovated quarters, approximately 7200 square feet in size. Included are a large museum-foyer, the Clendening Reading Room, the Jager Seminar Room, student and faculty offices and workrooms.



The Clendening Reading Room. (Photo courtesy of Clendening History of Medicine Library.)

The museum-foyer, which was awarded recognition in an architect's competition for lighting, contains four large display cases, portable cases, and assorted medical artifacts and pictures along the walls. Principal displays, which are rotated, include artifacts of Oriental, East Indian and African healers; frontiers and Civil War artifacts, nursing bottles, bedpans, microscopes, pharmacy materials and obstetrical instruments.

Plans call for further renovations of another 7200 square feet in three or four years. This proposed area will house class and seminar rooms for the Department of History and Philosophy of Medicine, archival space and storage of older journals transferred from the Dykes Medical Library.



The Clendening History of Medicine Library and Museum

Chairman: Robert P. Hudson, M.D.

Address: Kansas University Medical Center,
Kansas City, Kansas, 66103.

Telephone: (913)588-7040

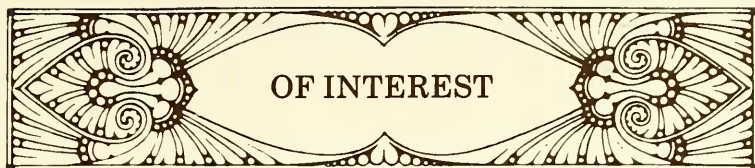
Hours: Monday - Friday, 8:00 a.m. to 4:30 p.m.
Closed weekends and holidays.

Admission: Free

Restrictions: None on site. Some on interlibrary loans.



A group of the accused women, guarded by members of the Royal Hungarian Gendarmes. (Photo courtesy of Magyar Munkástörténeti Múzeum.)



Arsenic and No Lace

by Ferenc Gyorgyey

The year was 1929—ten years after Hungary had been dismantled by the peace treaty imposed upon her at the close of World War I. What was left of the once great nation of the Magyars was a small, impoverished country in which three of every ten people were beggars. In such a depleted society it was the peasantry that had come to stand for whatever remained of stability and endurance. The peasant, after all, has never so far to fall. Hardworking, decent and deeply religious, peasant women were often referred to as saints.

The date was December 13, in the town of Szolnok, the county seat for the village of Nagyrev, in the region called Tiszazug. The courthouse was alive with more than usual activity. Four grandmotherly women—clad in simple black honesty—sat with hands clasped in their laps. If physiognomy, bearing and clothing were of any diagnostic reliability the visitor to this courtroom would believe them to be the victims of a crime, never the perpetrators. But each of these four “nenik” was on trial for the murder of her husband.

Nor were these the only women so accused. This trial was but the first of many that would take place here in the weeks and months to come. For in Nagyrev and its surrounding hamlets it was alleged that women had been killing their husbands, lovers, fathers, sons and even their mothers-in-law with shocking frequency over a period of no less than two decades. What was happening in Nagyrev? Had the female population been seized by some demonic influence as many believed? Were these killings the product of some mass psychosis to which only the women were subject? Or was each alleged murder a calculated termination of one woman’s lifetime of family misery? Or the ultimate act of liberation? Let us enter the courtroom and see.

The first plaintiff, sitting on the left, is Rosalia Holyba. Her face is gaunt, her features are impassive, almost resembling those of a submissive beast. In October, 1924, she put arsenic in her husband's coffee. The idea had been suggested to her by the next lady on the bench, Lidia Sebestyen, a substantial though not obese matron of seventy. While she does not show her age, Julianna Lipka, third from the left, looking perhaps ninety, is only sixty. She has, according to newspaper reporters, "the most loving blue eyes as well as kindness and compassion." It was as early as 1912 when Lipkane* murdered the wife of Aron Kardos (of whom she had been hired to take care), with arsenic, the poison of choice in Tiszazug. Later she also poisoned Gyorgy Zsiros and his wife. The motive? Gyorgy, her own stepbrother, was lame, and therefore Lipkane, the good-hearted relative, only wanted to relieve him of his suffering. Zsirosne, on the other hand, was a shrew. Nobody in Nagyrev could stand her. Better she should be in the "after-life." In addition, Lipkane, now a woman of experience, took it upon herself to advise and help Maria Koteles (sitting on the right end of the bench), to finish off her first husband, Laszlo Kokai. He was, after all, rather rude and he drank. One day in 1919, his apricot brandy was laced with arsenic. When the amount did not prove sufficient, his coffee was tampered with. A small bottle of surplus poison was found in the coffin when his body was disinterred.

By the date of the first trial, fifty graves had been opened in the village. According to the autopsies, forty-six of the bodies contained lethal dosages of arsenic. The chief villain, the midwife Fazekasne, had committed suicide before the gendarmes arrived to arrest her. Of three other suicides one was Csabaine, whose husband's remains proved to be completely free of the poison, one of the few. Why did she do it then? Did she murder someone else? Did he, the husband, fail to drink or eat the tainted food without her noticing it and did he die of natural causes, while she, in police custody, believed herself to be the murderer? Or was she simply confused? There are dark places in the murdering mind that no trial can illuminate. A trial is meant only to prove the deed itself.

What is evident in the comportment of the four is that they neither felt nor showed the least bit of remorse. In the records, Dr. Sandor Feldmann,¹ a noted psychologist and expert witness for the defense who had examined these four women a day before the trial, described the accused as "looking, speaking and moving as any other tired out old peasant women." Their behavior was in

*Throughout the text, when the suffix "ne" is added to a Hungarian name, it is the equivalent of "Mrs." Thus, "Lipkane" means "the wife of Lipka." When the woman's full name is used, the "ne" is superfluous.



The first trial. From left to right: Rosalia Holyba, Lidia Sebestyen, Julianna Lipka and Maria Koteles with their prison guards. (Photo courtesy of Magyar Munkástörténeti Múzeum.)

general "apathetic, complaining and religious." Lipkane was resolute: "I know how to pray. Every night I say my prayers. God will deliver me because I am clean as a good soul." When Dr. Feldmann asked the plaintiffs to sign their names, each woman in her separate cell wrote down her maiden name. When asked to sign their married names, they recoiled as if they had been ordered to do something very wrong.

Still, both Rozalia Holyba and Julianna Lipka admitted to having had nightmares in which they had fallen and sunk into soft earth; then, gasping for air, they desperately tried to climb out. Of the four, Lipkane came from the poorest background. At the age of three she had become an orphan and was cared for by neighbors: her childhood was spent moving from house to house. At the age of ten she began working as a servant. It was said of her that she would never hurt a fly if she could avoid it. Instead—as the testimonies reveal—she provided poison to other women because she had long watched them suffering, even tortured by their evil husbands.

In the grand tradition of psychiatric testimony, Dr. Feldmann concluded with a paradox: "The murderesses are normal, their minds are not diseased; on the other hand, emotionally and psychologically they are not accountable."

No fewer than thirty-nine witnesses were called to testify at the first trial. The confessions, taken first by the police, and later at the prosecutor's office, were withdrawn before the judge. None of the accused complained about any physical pressure being used at the interrogation. When the matrons were asked what they had felt or experienced, they only mentioned nervousness, fear and occasional threats. Here, in fact, is how the confessions were obtained: the gendarmes, under the command of one Janos Cszaszar, put Lidia Sebestyen and Rozalia Holyba into a room where, hidden under a high peasantbed, covered with a long comforter reaching down to the floor, lay Sergeant Bartok. Feeling safe in privacy, the two women spoke freely together about the murders and about other people who had been involved. Having heard enough, Bartok crawled out from under the bed and the stunned women admitted everything. Nevertheless, even these confessions were withdrawn before the judge.

By this time, a cavalcade of defense attorneys, in search of business, has descended upon the region. They counseled these women not only to deny the murders but also to avoid describing any possible symptoms of arsenic poisoning during their husbands' final days. Diarrhea, cramps and vomiting were never to be mentioned. Because in some cases almost two decades had passed since the alleged crime, it was often impossible to reconstruct exactly what had happened. To further confuse the issue, it had been the custom of

the women to call a doctor to attend the designated victim prior to the poisoning. Since the physician more often than not had found the doomed man suffering from tuberculosis, peptic ulcers or some other legitimate illness, it came as no surprise to him when the patient subsequently died.

In the case of Rosalia Holyba's husband, it was a Dr. Szegedy who had been summoned.² He testified to having diagnosed the victim's bronchitis on September 30, 1924. A week later, while passing through Nagyrev, the doctor learned of Holyba's death. He was dismayed and went to Holyba's house to investigate: "... the wife told me that her husband started to get better after my medical visit. In fact, he got so well that one night he even drank and sang, accompanied by a gypsy violinist. Then he started vomiting, diarrhea set in and the next morning he was dead." At the trial in 1930 Holybane said: "My husband has never had nausea or diarrhea until his death."

The poison was obtained in two forms. Arsenic acid, used for the extermination of mice and rats, was readily available in shops in powder form. The more popular liquid form was prepared by soaking flypaper in water and using that solution. Lipkane's later testimony attests to her "charitable" nature:

It is true that I gave Maria Koteles the flypaper-liquid. She had been complaining tearfully about her husband. He was cruel to her and treated her very badly. I felt sorry for Kotelesne. Why her husband was so mean to her I have no way of knowing. I don't know whether she had an affair with her present husband at that time, either. I only know that I felt sorry for that poor woman so I gave her a few ounces, thinking he'd only become sick a little. Besides, I took the water from an old, much used flypaper—not even the flies died on it anymore. I am sure that liquid could not kill anybody.³

Kotelesne's testimony followed in the same vein:

Julianna gave me a solution and said my husband would stop drinking after taking it. I was supposed to put it in his apricot brandy, which I did. Then I put the bottle back in the cupboard. When I looked for it next morning it was gone. My husband did not mention that he'd finished his "supply," but after a few days he began complaining and moaning. He did not vomit; he had no diarrhea, only his legs hurt something fierce.

These women did not know that arsenic could be traced by the methods of forensic medicine. Kotelesne explained: "It is true that Auntie Lipka told me



Esther Takacs, who had administered arsenic (poison) to her father and mother-in-law. (Photo courtesy of Magyar Munkástörténeti Múzeum.)

that not even a hundred doctors could notice that he had taken poison, even if he died." Later Kotelesne corrected herself: "The way I understood this was that nobody would notice nothing because nothing bad would happen to him. I didn't even know that somebody could be poisoned." Then, as an afterthought, she added: "It is true that before he became ill, he wanted to eat cottage cheese and cabbage."

The idea that arsenic could not be detected in the victim's body was common and accepted by all the women of Tiszazug. This misconception might have originated from Fazekasne, the midwife, or it might have emerged gradually, since not one of the murders had been discovered for so many years. The method of investigation for arsenic poisoning used at the time was described thus in the August 20, 1930 issue of *Csendorsegi Lapok*, the official news organ of the gendarmerie:

After the opening of the coffin, 10-15 decagram substance is taken from five places: soil from above the coffin; soil from under the coffin; parts of the brain, chest and abdomen; parts of the coffin from under the groin area; from other parts of the coffin, and remnants of wreaths. These are put into glass containers numbered 1-5 and sealed with black wax and then placed in tin containers which are put in wooden boxes. (The wax has to be black, colored with soot, because the red stamp-wax is colored with cinober[sic] or minium and therefore mercury or lead can get mixed up in the material.) Some "neutral" soil is also taken at a spot about 5-10 meters from the grave. The purpose of this is that the negative findings of this material strengthen the positive findings obtained in the body.

The "neutral" soil did actually show arsenic in one case in Tiszazug. The defense claimed that arsenic exists everywhere and therefore the findings in the body could have been caused by seeping in from the outside. The prosecution maintained that while the arsenic in the "neutral" soil was only a trace, the bodies contained ten to twenty times more of the poison.⁴

There was some suspicion that the Hungarian government, reluctant to reveal that this custom of radically eliminating menfolk had gone back not twenty years but indeed for a century or more, had placed a twenty-year limit on exhumation. Whether this suspicion had any validity or not, the records of both the trial and investigation show that the twenty-year time limit was scrupulously honored.⁵ Also, autopsies were expensive; it was not profitable to delve too far back in time. But... a hundred years? Had this secret solution to unhappy life been handed down from mother to daughter? Had it

now become incorporated into the very culture of society? *O tempora! O mores!* A sociological study of the events published in 1935 suggested that the "number of suspicious deaths exceeded 200." The number of confirmed arsenic victims can be estimated around 165. The murders were committed solely by women. The only man ever convicted was an accomplice but not an active participant. In one of the papers this man was depicted as "a thin, tubercular individual, lost in his clothes, who kept muttering, "The women made me do it! I was but an unsuspecting child in their hands..." The same author continues with a succinct fact sheet: "These women first murdered the ill and the old who were a burden to the household. Next came the husbands who were brutes or whom they no longer wanted to live with—they had to be eliminated so the widows could marry again. Some murdered only for inheritance. They did not consider it a crime to kill a 'superfluous' person."⁶ At first, in the interest of getting confessions, the gendarmes would encourage this lapse by reassuring the accused that their acts amounted to no more than mischief.

It is interesting to examine the reaction to these "uniquely female" crimes. Prosecuting attorney Janos Kronberg stated in his summation of the second trial: "It is in the basic nature of women to enjoy suffering of others. That is why most poisoners are women. Women are cowards, therefore they murder insidiously."⁷

At the second trial, Krisztina Csabai, who murdered a beastly alcoholic husband, and Eszter Takacs, were the accused. While the former was a wretched, battered women, the latter emerged as a bona fide villain. Takacsne married her deaf and mute mate in 1913 and moved with him to his parents' house. Before long her mother-in-law died. Then her father-in-law, Laszlo Takacs, turned ill. The visiting physician diagnosed his problem as inflammation of the kidneys. Although severely afflicted, the senior Takacs allegedly continued drinking and making passes at his daughter-in-law. The atmosphere in the household was obviously less than tranquil. Soon the old man died also.

At the trial young Eszter Takacs categorically denied murdering her father-in-law. She argued that the only evidence against her was the positive presence of arsenic in the autopsied body and the fact that she had bought quite a substantial amount of flypaper. She willingly admitted buying the flypaper in December of 1922, but claimed it had been purchased to prepare for the onslaught of flies next summer. Ironically, Takacsne was acquitted, while Csabaine received a fifteen-year-sentence even though all witnesses testified strongly in her behalf. Who can comprehend the vagaries of jurisprudence?

It is noteworthy that the population almost always stood by and spoke for the murderers, showing genuine pity for those women. Zsigmond Moricz, the great Hungarian writer, who was present as a journalist at the trial and wrote moving, powerful reports about the events, also observed this phenomenon. In almost all cases the villagers took a stand against the victims. In the Csabai case, for example, not only the children but the entire neighborhood had been aware of the extreme brutality of the murdered husband. Similarly, the peasants' testimonies were in favor of the perpetrators even when the victim was a decent person and had never committed violence. It appears as if these simple people were saying to the outside world: "This is our business! We do not want your interference! These are our own murderers, these are our own victims!"

The most scandalous trial of all took place in January, 1930. The two richest women of Nagyrev stood before the judge. Maria Szendi Kardos and Julianna Kovacs Foldvari would eventually come to personify the poisoners of Tiszazug to the general public. Moricz filed an almost poetic rather than journalistic account about this sensational event:

One murdered her mother, her husband, and lover. The other her only son and her spouse. I am looking at their faces. They are not of low class persons, not of scum, not of the deprived. On the contrary, they are the ornaments, the pride, the flower of the Hungarian people. Two lovely women from among the Calvinist Magyars who usually constitute the backbone of the nation. When young, they are beautiful maidens; later, hardworking wives, concerned, caring mothers, and finally, wise and all-knowing grandmothers—the primordial matriarchs!

Foldvarine's mother was a dour, miserly, frugal peasantwoman, whereas she herself subscribed to *joie de vivre*, and wanted only to have a good time. So, to get her inheritance earlier, she baked flypowdered biscuits. Later when she grew tired of her husband and bored with her lover (a sick, dyspeptic man, not worth bothering with anyhow), she eliminated both without qualms.

The other lady, Kardosne, was a woman of a hundred men: a rare rural nymphomaniac. In the courthouse, incredible tales were circulating about her: friend and foe, gentlemen and ditchdiggers alike, rolled on her clean pillows. There is no telling how many of her bed partners were fed with arsenic. At the trial she was accused of only two murders. What a strange predicament for sweet old grandmothers.⁸

In her testimony Kardosne put the blame on the midwife Fazekasne, who had allegedly hated Mihaly Kardos, her erstwhile lover, and wanted him out of the way so that he would stop reminding her of the good old times. According to the accused, Zsuzsanna Fazekas despised her son as well—out of jealousy. Kardosne admitted being aware of those motives, but insisted she had no part in the midwife's actual administration of the poison. Three days later, by January 18, on a Saturday morning, Kardosne broke down. A Budapest daily, *Az Est*, reported the change in her testimony: "... The woman with her hard, straight back sits down in the dock as a wreck. Her face is pale, she gazes ahead in the air and mumbles: 'Please listen to me ... yesterday I lied ... I will make a true confession ...'" The judge later read it to her to be sure she understood the gravity of her testimony. [She defended her behavior:] "My son behaved terribly. And he was sickly, too ... I thought, sooner or later he would go to prison. It is better if I do away with him than if he brings horrible shame on me and himself."

Foldvarine on the other hand, could not be shaken. She maintained her innocence during the whole interrogation:

"How come so much arsenic was found in Karoly Foldvari's body?" asked the judge.

"I don't know, I loved the dear heart so much!"

"I don't question the sincerity of your emotions, but how come you were in common-law marriage with Laszlo Toth merely six months after the events?"

"The only reason for this was that I needed someone to help with my own sick parents."

"Toth moved in with you in 1924, and in 1926 you poisoned him, too."

"He already was a dyspeptic when he came to me, I really didn't poison him."

"How can you explain, then, the considerable amount of arsenic in the body of Laszlo Toth?"

"I have no idea how it got into him, I loved him very much."



The Honorable Gyula Fuchs, the presiding judge, with the arsenic bottle Maria Koteles used to poison her husband. (Photo courtesy of the author.)

Noted Budapest journalist Rezso Szirmai gave a gripping account of the Kardos case in *Az Est*:

The years, the passing years of the women caused the death of the men in Tiszazug. Maria Kardos' son Sandor grew up to be 23. The mother looked at her child with disdain: she resented being the mother of a 23-year old, adult man. Moreover Sandor was a good boy, a pious boy; the most diligent singer in the church choir, with a lovely voice. Then one day, he became ill. A terrible stomachache started to torture him. Medication was at hand: his mother gave it to him. She sat down at his bedside in her best holiday outfit.

The son got frightened: "Mother, I don't want to die!"

She comforted him: "Hush, hush, you won't die. Take this medicine and sing something beautiful to me. One of the songs you sing in church! Let your mother revel in her son's talent."

And the boy sang. He drank the medicine and went on singing, until a strong cramp silenced him forever; until the arsenic finished with him.⁹

This sordidly sentimental scene—the mother, the poison and the singing "princely boy," might have been true, but the character of the son emerged somewhat differently during the testimonies. Terezia Kiss testified, for example, that Sandor used to steal from his mother; he was a known gambler and a chronic alcoholic. Others described how he started out as a streetcar-conductor in Budapest, then became a policeman for a while, but was fired from both jobs for theft. His singing in a choir is also questionable; one of the frequently cited reasons for the mass tragedy was the total lack of religious life in the village.

Julianna Foldvari was acquitted, Maria Kardos was convicted and hanged. In the Archivum of Szolnok, there is a private letter buried among pages and pages of confessions and records of the court proceedings. It was sent by someone named Rudolf Kardos, then living in Germany. In his letter Rudolf complained that he was alone in the world and yearned to belong to someone. He wondered whether he might be related to Maria Kardos. Why, one asks, would he want to be related to her? Could it be simply that he read in the newspaper that she had been rich, and he wanted to be her heir? It is very unlikely that the writer got an answer to his inquiry.



Maria Kardos, one of the richest peasant women of Nagyrev, was later executed for the murder of her husband and only son. (Photo courtesy of Magyar Munkástörténeti Múzeum.)

Despite the numerous trials that followed, no satisfactory explanation surfaced as to why these women killed *en masse* and without conscience. Again and again the midwife was regarded as the main culprit, although during the proceedings it became apparent that several other women's hands had been tainted by as many murders as the midwife's. Still, the public preferred to put the whole blame on Fazekasne. They sided with Moricz, who presented this angel of death so eloquently:

Like a fatuous Eastern deity, perpetually devouring something with her bloody teeth, she moved about jovially, tapping her belly while declaring the death penalty over the sick, the lame, the ones with "loose morals." It was as if she came as an apocalyptic horsewoman who held court, judged the world, and eliminated the weak and the miserable, asserting, "Why bother suffering with them?" And those wretched people fell for her bait—refusing to suffer further, they carried out her instructions by and large meticulously.¹⁰

The other culprit often quoted was poverty. It seems to have been overlooked that several of the accused were not poor at all. The cause could not have been poverty alone: there were hundreds of similarly miserable villages in Hungary. Was it perhaps the lack of land? Granted, most of it was owned by landlords and a peasant had limited if any chance to better himself by adding to his miserable estate. However, according to Town Clerk Gyula Molnar, there had "always been plots for sale." So, this explanation, too, was unsatisfactory.

The absence of religious tradition was also cited as a cause. The interrogation on December 14 proceeded along these lines:

"Tell me about the religious morality of the people. Did they attend church services?" the judge asked one of the major witnesses.

"Very few ever went to church," replied the old local Town Clerk.

"What religion did they profess?"

"Seventy percent Protestant, thirty percent Catholic."

"Did the Catholics have a place of worship?"

"No. They had to walk to the next village."



The accused women taking exercise in the prison yard in Szolnok, Hungary. (Photo courtesy of Magyar Munkástörténeti Múzeum.)

“Did many of them go?”

“Six or seven women maybe, at the most.”

“Did the Protestants go to services?”

“Only very few.”

One of the conversations between the judge and one of the accused was carried by the *Literary Digest* in the United States.

“Did you attend church?”

“Sometimes.”

“Did you listen to the sermon?”

"Rarely."

"Do you know what the Ten Commandments are?"

"No, I don't know."

"Can you name at least one?"

"Never heard of any."

"Have you ever heard this sentence: 'honor your father and mother'?"

"Never heard it mentioned. My parents taught me only the Our Father."

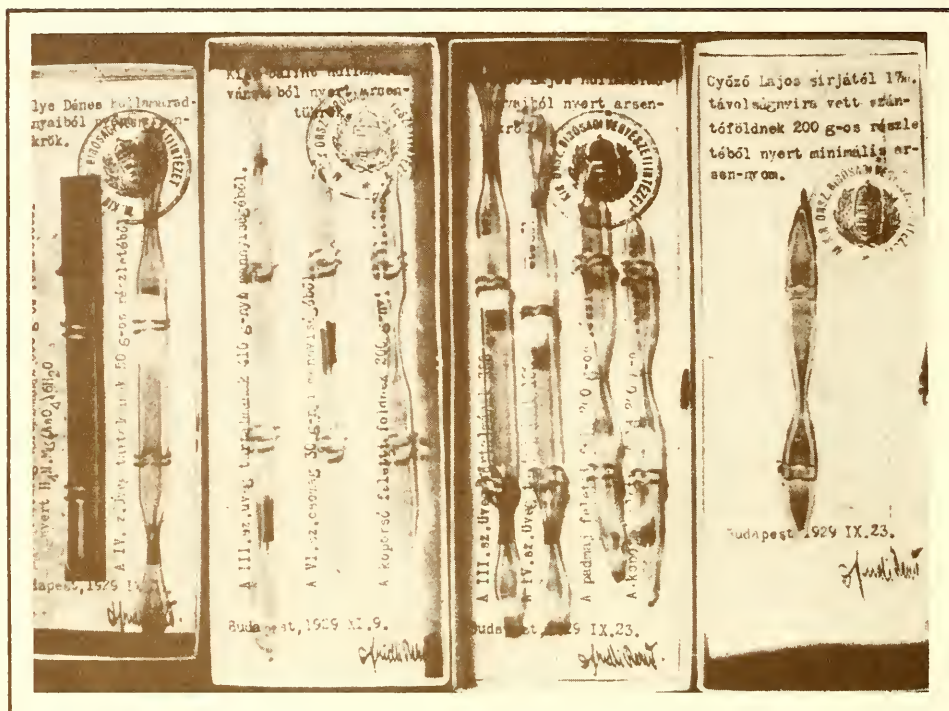
It was a serious oversight on the part of these parents—their daughter murdered them both.

Judging from the surnames, the community was inbred to a serious degree. The same family names come up again and again. As an example, a different Foldvarine from the one mentioned previously was also accused. Her testimony during the court proceedings is also very revealing. On April 12, 1930, the Superior Court approved the acquittal of Maria Foldvari, even though her late husband had the distinction of possessing the highest concentration of arsenic of all the bodies that had been exhumed. His wife did not deny the cramps and vomiting like the other accused. Instead, she pointed her finger at Lidia, a daughter from her husband's first marriage. At the trial the wife testified:

I married Sandor Foldvari in 1914. We lived happily and never argued. He died 20th of March, 1920. On that day he visited his daughter. After he came home he asked me to make his bed. I inquired about his health; he did not know what ailed him. He said he had only soup at his daughter's and also drank some wine. I scrambled two eggs for him. Then he started to vomit. The next four days he hasn't eaten anything except the soup his daughter brought him. From then on he went on vomiting. The day before he died Lidia offered him coffee. He swallowed it, lit his pipe, his head then flopped, his coffee spilled all over and he died.



Maria Foldvari, accused of poisoning her husband and his successor, Miklos Olah. (Photo courtesy of Magyar Munkástörténeti Múzeum.)



Photograph of the original metallic crusts obtained from the Royal Prosecutor's Office, published in the official organ of the Gendarmerie in August of 1930. (Photo courtesy of the author.)

When the President of the court asked her if she was accusing the daughter of murdering her father, Mrs. Foldvari replied: "I truly don't know, but every time she gave him anything my husband immediately vomited."

This is the only case where the accused described the revealing symptoms of arsenic poisoning. She admitted to it because her purpose was to implicate someone else. But the gendarmerie established that Lidia could not have committed the crime, since she was not even in the village. There was also the little matter of a certain Miklos Olah. After her husband's death, Foldvarine had lived with a gentleman by that name in a peaceful, happy, common-law marriage until July 24, 1924 when the unlucky Olah died suddenly. In his body, too, coincidentally perhaps, an excessive amount of arsenic was found at the autopsy. Yet, Foldvarine went free; who can remember so many years later about who had what for dinner and when did who start feeling sick?

The difficulty of obtaining proof after the passage of years was compounded by the fact that the local coroners were completely unqualified for their jobs. When the judge read the causes of death given for the victims, loud laughter at times interrupted the proceedings. The merriment came from the journalists, not the peasantwomen, the two largest groups that filled up the room. No wonder!

In cases of proven arsenic poisoning, for instance, the causes of death were stated as: 15 decrepitude, 10 unknown causes, 8 pulmonary phthisis, 3 psychosis, 3 gastric affection, 3 cardiac paralysis; 3 gastric ulcer, 2 stroke, 2 calcification of the arteries, 2 alcoholic poisoning, 2 disease of the kidneys, and cases of cancer, atrophy of the spine, dysentery, typhus, pneumonia, general weakness, hydrophobia, softening of the brain, peritonitis, etc.¹¹

For years various theories appeared in print attempting to give some acceptable explanation of the Tiszazug occurrences. According to the new minister of the village, for instance, alcohol was seriously implicated also: "From all sides, Nagyrev is surrounded by vineyards. Understandably wine did enormous spiritual harm to the population. Nowhere else in the country can one find more drunkards than in the villages of Tiszazug." Others retorted that drinking was no heavier in that part of the country than anywhere else. By the same token, customarily it was not the women who drank. One of the most touching records, also from the Szolnok Archivum, is the handwritten petition of Anna Cser. It is difficult to decipher the heartbreaking fragments, repetitions and lamentations of a peasant woman hardly able to write:

... he said he [would] beat me to death, the children also ... when my time of delivery got near he still beat me, he stepped on me ... I screamed ... two weeks later the child was stillborn ... the doctor said his alcoholism is incurable. I became pregnant again with the sixth child in 1921 ... I lost it in December ... two months later I became pregnant again ... he never left me alone. He knifed me ... broke the chair on me—I was blue all over ... I have two children left and for their sake I ask for clemency. ...

How much effect such testimony had on the court is not known. Anna Cser was convicted, but not for murdering this inhuman beast of a husband, which she in fact did not do. Instead of him, she poisoned her in-laws.

The mental condition of the perpetrators was brought up again and again both by the defense and the prosecution. Among the papers found in the Szolnok Archivum, there is a report by the doctors Ovari-Papp and Orsos, describing the general condition of Maria Koteles:

[She is] a well developed and well fed woman of middle height ... pupils of equal size, reacting well ... uses eyeglasses for sewing, vision good otherwise, hearing: good ... reads satisfactorily, understands every question well and answers them correctly ... no hallucinations ... she knows that to take someone's life is a crime ... no noticeable mental affliction or weakness of faculties.

In the ensuing years yet another interesting theory was voiced. This theory concerned World War I and its effect on the women of Tiszazug. As most of the husbands became soldiers, they left their wives to fend for the children and themselves. The women worked the fields, sold the produce, tended the animals. Soon they realized that the work previously performed by their mates was not an impossible task. Two factors encouraged success in their position as heads of households. The price of everything had risen considerably due to the war, and in general, the women were better salespersons than their husbands had been. Also, there were Russian prisoners of war available to help out on the farm. If the lady of the house was not satisfied with the work of one "Ivan" she brought out of the camp, she could choose another. These war prisoners were bored to death in the camps and, being peasants themselves, liked to work outside. It was better than being cooped up in the barracks. The food was also better in the villages. Therefore, it was in their interest to be obedient so that they would be recalled to work. Sometimes they also found their way into the bedroom of the house, where their behaviour was most likely far more considerate than that of the previous inhabitant.

When, after the war, the husbands returned and started ordering their women around as usual, the idea of retaining their freedom naturally appealed to the ladies, who had learned that they no longer needed "masters." On the other hand, while it is true that some husbands were indeed poisoned right after their return from the front, these local murders had started long before the war and the arrival of any tender POWs. Besides, the same situation existed in numerous other Hungarian villages without bringing about mass murders as a result.

An even more significant theory evolved that intertwined these poisonings with birth control. Women like the midwife Fazekasne, and other "female-experts," have always exercised tremendous power by performing illegal abortions. The concept of *egyke*, meaning only one child per family, also persisted primarily in certain well-to-do parts of the country. To guarantee no more than one offspring, intensive birth control had to be practiced—and that included abortions. It eventually meant that marriages produced only one offspring, and thus the estates of two families united and grew in the hand of the lone successor. The villages of Tiszazug did not completely follow this fashionable sociological trend. Still, the attempts at controlling reproduction usually resulted in granting total power to mothers-in-law. Husbands did not want to know what was happening, although they usually concurred with the results. They regarded this problem as something pertaining to women exclusively.

Barna Szladek, Captain of the Gendarmerie, proposed an interesting theory:

Love life of the village folk is sheer monotony, a mere habit . . . most women get old and die without ever having felt true love; emotions play hardly any role in lovemaking. . . . If, due to some unforeseen events or because of an opportunity or other factors . . . women get to experience the pleasure of (physical) love, they change completely. Sex then becomes much more important: a passionately demanded routine of life.¹²

Can it be believed that for a thousand years (the Magyars occupied the country in 896), no peasant woman had ever achieved orgasm, or that once it happened, mass murder had to follow? Perhaps, but it is entirely conceivable that these village poisoners simply decided to eliminate the major obstacles which customarily prevent longsuffering women everywhere from leading a peaceful, relatively bearable, human life. Doubtless, similar temptations have been present at other times, at other places, but were rarely permitted to go beyond the wish to make them so. The action of the Tiszazug women may be seen as a crude, cruel harbinger of women's liberation, not unlike the

rebellions of Nat Turner or John Brown just before the emancipation of the slaves. The defiant murders at Tiszazug, committed by uneducated, simple peasant women, who out of greed, personal grudge, family strife, revenge and jealousy, unwittingly foretold the more complex, more altruistic reality of the later movement.

One of the most enigmatic aspects of this phenomenon is its conspiratorial nature. It is common knowledge that gossip, rumors, leaks and squealing have always accompanied illicit group activity everywhere. But here, the whole village, at least the whole female population of the village, knew—had known, not for a year or two but for at least two decades—why and how all these men had died. Yet, the secret was so ancient, so overpowering that except for a couple of anonymous letters at the end, no one broke the silence. One can not help wondering how it was that the men never caught on and became suspicious. It is equally remarkable how a group of people come to accept a gruesome, unnatural practice as the norm and follow it without hesitation and guilt.

In the summer of 1930, a forensic expert described the panic that ensued after the trial:

These notorious cases of arsenic poisoning have stirred up the fantasy of people in other rural regions of Hungary, too. As a result, women who have remarried or started a common-law relationship after losing their spouses were being accused of murder. An onslaught of denunciations started; district attorneys around the Great Plains had a hard time trying to select those cases where it was justified to start legal procedures.¹³

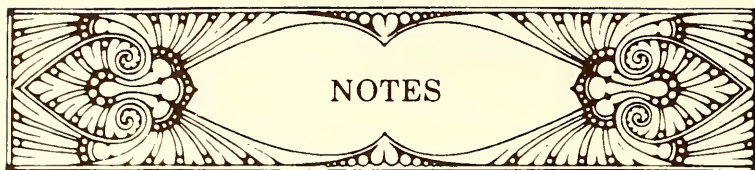
In 1961 a sociological study titled *Tiszazug* was published. In this study author Sandor Illes describes modern life in Tiszazug as quite pleasant. Though there is still no train service in the region, convenient bus service connects the villages with other parts of the country. However, the author asserts that although the problems that had caused the "trouble" are no longer present, there may still be an ominous note to life in this particular village: "The woman takes the child to the doctor, buys the clothes for him, and not only for the child but for her husband, often for her in-laws, too. This way her taste is slowly forced on the whole house. One can freely say that Nagyrev is ruled by women."

We have murdered our husbands,
Fifty strapping big men.
And we loved, only loved—
God only knows whom we loved.

—Mihaly Babits, *The Danaides*



The cemetery in Tiszazug, where many of the victims had been buried and were subsequently exhumed. (Photo courtesy of Magyar Munkastorteneti Muzeum.)



1. *Pesti Napló*, Dec. 10, 1929, 5.
2. *Pesti Napló*, Dec. 14, 1929, 5.
3. From official court records taken at the Dec. 13, 1929 trial in Szolnok (Szolnok Archivum).
4. The analysis was done by the Marsh method (at that time nearly a hundred years old but still in use). Marsh, James. "Account of a Method of Separating Small Quantities of Arsenic." *Edinburgh New Philosophical Journal* 21 (1836), 229-236.
5. A forensic expert displayed that of the exhumed bodies the earliest burial took place on January 11, 1911. Orsós, Imre. "A tiszazúgi arzénmérgezések orvosi vonatkozásai." *Orvos Szovetség* 37 (1934):49.
6. Szeibert, János. *Elsodort falu a Tiszazúgban* (Budapest: Stephaneum, 1935), 7.
7. *Pesti Napló*, December 28, 1929, 4.
8. Móricz, Zsigmond. *Riportok* (Budapest: Szépirodalmi, 1958), 6.
9. *Az Est*, January 18, 1930, 3.
10. Móricz, 32.
11. Beóthy, Konrád. "Die Massenvergiftung durch Arsen." *Deutsche Zeitschrift für die Gesamte Gerichtliche Medizin* 23 (1934):170.
12. Szladek, Barna. "A Tiszazúgi Tömegmérgezés." *Csendőrségi Lapok*, August 1, 1930, 696.
13. Feldmann, Ignác. "Az Arsénnek . . . kiszámításáról." *Gyógyászat* 70 (1930):749.



AUTHOR



Ferenc Gyorgyey, a native of Hungary, came to the U.S. after the 1956 Hungarian Revolution. He is the Historical Librarian at the Yale Medical Library, a position he has held since 1968.

As a political prisoner in Hungary in the late 1940s and early 1950s, Ferenc Gyorgyey met an old peasant known by everyone as Uncle Pali. Although he had had no formal education to speak of, Uncle Pali was intelligent and had an insatiable curiosity for what he called the “mysteries of history.” One of his favorite topics was the area known as Tiszazug and the village of Nagyrev. Uncle Pali claimed that the women of Nagyrev “had been murdering their menfolk since time immemorial.”

Ferenc Gyorgyey was intrigued by Uncle Pali’s tale and, upon his return to Hungary in the early 1980s, he began an investigation that grew into a thorough search in Budapest libraries and the Szolnok Archives. “Arsenic and No Lace” is the result of his research.

The author would like to acknowledge his appreciation to his good friends, Richard Selzer, M.D., and Sherwin Nuland, M.D., who encouraged, advised and corrected the final revision of this sad tale.

ERRATA

Two photos which appeared in "An Evaluation of Some Early Obstetrical Instruments" (Caduceus, Spring 1987, Vol. III, No. 1) were inadvertently altered in production. Our apologies to authors Dixon Burns and Lisa Calache. The corrected photos and legends appear below.

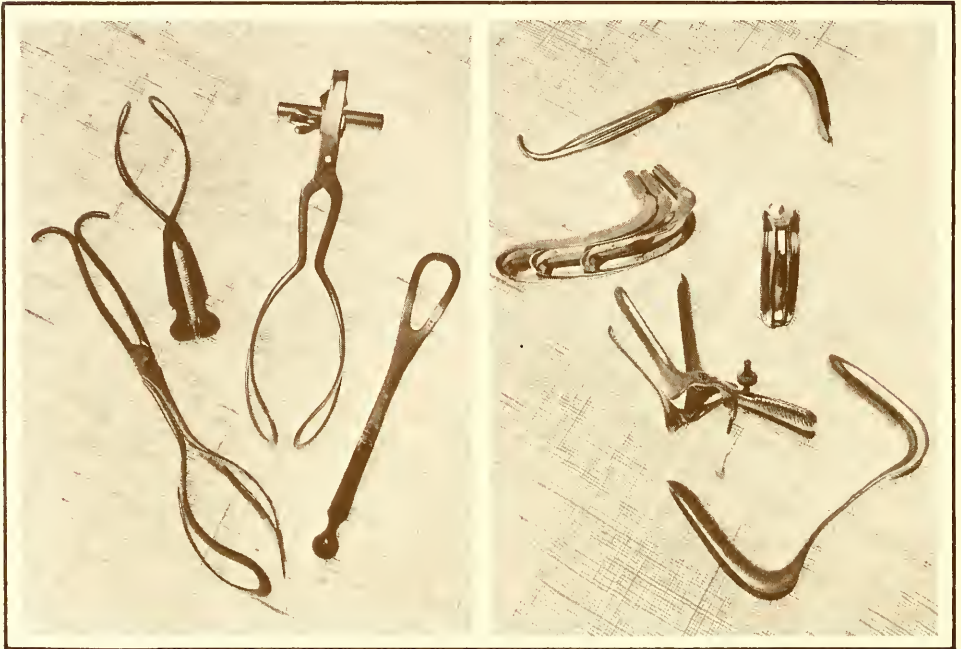


Photo on right: Vaginal specula. This duck billed speculum (foreground), used in combination with the knee-chest position, aided Sims in determining the presence of vesico-vaginal fistulae. This photo originally appeared on p. 40. (Photo courtesy of The Pearson Museum collection.)

Photo on left: Obstetrical forceps. Left to right: Wallace obstetrical forceps; Thomas' short obstetrical forceps; Tarnier's axis-traction forceps; and Lowder's collapsible vectis. This photo originally appeared on p. 35. (Photo courtesy of The Pearson Museum collection.)

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Dr. Kinney is professor emerita of Internal Medicine at Rush University/Rush Presbyterian-St. Luke's Medical Center in Chicago.

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